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The 1987 Annual Report of
the Agricultural Experiment Station of Michigan State University

A Century of Enriching Michigan's Future

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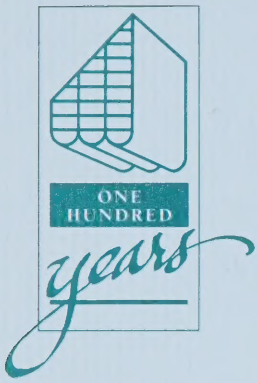
The 1987 Annual Report of the Agricultural Experiment Station of Michigan State University

A Century of Enriching Michigan's Future

Report prepared under the direction of Robert G. Gast, director of the Michigan Agricultural Experiment Station, and administrative associate Doreen Woodward. Design by Christine Altese; editing and production by Laurie Wink, information coordinator, ANR Information Services.

A Century of Enriching Michigan's Future



The 1987 Annual Report of the Agricultural Experiment Station at Michigan State University, issued in January 1988 as a public record, is a special document commemorating two important dates:

March 2, 1887—President Grover Cleveland signed the Hatch Act establishing agricultural experiment stations at state land grant colleges.

February 26, 1888—The Michigan Legislature created the Michigan Agricultural Experiment Station at the Michigan Agricultural College (now Michigan State University).

"A Century of Enriching Michigan's Future" is the theme for the MSU Agricultural Experiment Station Centennial. It reflects pride in past achievements and a progressive approach to setting new research priorities.

This report contains observations by Edwin Willits, the first Experiment Station director, and by Robert Gast, the current director, about the purposes and priorities of the Experiment Station then and now.

Many aspects of research investigated by Experiment Station scientists a century ago continue today, such as field tests of plants and animals and refinements of production practices.

Yet, the Experiment Station research staff and the scope of its concerns have expanded significantly. Agriculture and natural resources disciplines have become increasingly complicated as the result of the explosion in scientific knowledge and the discovery of such new technology as computers, genetic engineering and sophisticated laboratory equipment.

Today, Experiment Station research is as vital as it ever was to the development of an adequate supply of food and fiber and the maintenance of a quality environment for Michigan residents.

Discrimination in Favor of Agriculture

In the first annual report of the Experiment Station—covering the period from Feb. 26 to June 30, 1888—Edwin Willits gave a rationale for taxpayer support of agricultural colleges and experiment stations.

"What with the weather, untimely frost, difference in soils, blight, and mildew, uncertain germination, injurious insects, birds, and animals, coming unheralded and in unexpected character and numbers, noxious diseases to crop and beast, and the vicissitudes of seedtime and harvest, there would seem to be too much uncertainty to agriculture to call it a science, and too many elements of doubt to be solved anywhere by anyone, much less in a school room by theorists...

"Agriculture is in a sense too broad to be a science, or rather is the co-ordinate contribution of so many sciences that the field is too broad for any one man...

"This being so, the natural inquiry is, why then have the agricultural college or the experimental station? The answer is obvious. A special and thorough knowledge of the laws of nature as applied to agriculture will reduce the reducible uncertainties to a minimum and raise the production to a maximum."

Willits noted that Congress, in the 1862 Morrill Act providing a land grant for establishment of colleges of agriculture and the mechanical arts, had created places where experiments and investigations could be conducted.

"There was good reason for believing that in the development of the 'agricultural college' there have become associated with it and its several departments an aggregation of scientific thought and research, which could by concerted action accomplish substantial results," he said.

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"I can only add that each officer of the station entered upon his line of work with a zeal which is an augury of success."

EDWIN WILLITS
Experiment Station director, June 1888

What Shall Our Stations Do?

Willits reported that station officers "meet once in two weeks to discuss and lay out the work, and by conference make our labors a unit." Besides Willits and secretary/treasurer H. G. Reynolds, the station had six scientists.

While waiting for federal funds to begin operating the Experiment Station, Willits asked each scientist for a statement of proposed research in his division. Following are summaries of their statements, as well as highlights of their careers.

Robert Kedzie, chemistry and meteorology—planned to study the food value of ensilage corn and the effect of tile drainage. ***Career contributions:*** established state sugarbeet industry; was an early consumer advocate, exposing hazards of arsenic in wallpaper dyes, faulty kerosene lamps and sham fertilizers; began Michigan's first meteorological record.

Albert Cook, entomology—planned to experiment with insecticides, study beneficial insects, develop superior bees, experiment with bee forage, and investigate fungoid diseases of bees. ***Career contributions:*** discovered one of the first insecticides, a kerosene emulsion that destroyed insects without harming plants; made research information available to public through newspapers and farm journals.

William Beal, botany and forestry—proposed experiments on the physiology, field planting dates, mowing rates and variety performance of grasses and other forage plants; aimed to improve wheat by selection, cultivation and cross-breeding; proposed a law requiring seeds to be inspected for purity and vitality prior to being sold; planned to introduce forest species from other parts of the world and to plant ten acres with "promising mixtures of trees for raising valuable timber." ***Career contributions:*** was first to cross-fertilize corn to increase yields through hybrid vigor; established the first seed testing lab in the United States and the longest seed germination study (still conducted every 10 years); developed Beal botanical garden; surveyed state forest resources.

Samuel Johnson, agriculture—proposed feeding experiments for beef cattle, sheep and swine of different breeds and field experiments on various soil preparation and cultivation methods, seeding rates and fertilizer application methods and rates. ***Career contributions:*** as superintendent of the college farm, maintained an efficient, profitable operation that was a model for farmers; developed purebred shorthorn cattle herd.

Edward Grange, veterinary science—planned "to study the 'germ theory' with relation to contagious diseases of animals," and to test the effect of spaying on the growth and feeding qualities of heifers.

Liberty Hyde Bailey, horticulture—planned to develop new varieties of fruits, vegetables and ornamental plants by selection and by crossing and hybridizing; proposed to improve old varieties by using various fertilizer and tillage strategies; and intended to introduce new varieties and species of Japanese, Chinese and Russian plants. ***Career contributions:*** established the first horticulture laboratory in the United States; left for Cornell in 1888, where his accomplishments earned him the title "father of American horticulture."

Early Field Stations

From the beginning, the Experiment Station has maintained field stations to solve agricultural problems in parts of the state beyond campus.

In his first annual report, Willits wrote about the Pine Barrens, "a special matter

Michigan Agricultural Experiment Station 1888 to 1988

- largest campus research organization
- statewide network of 14 outlying field stations
- only publicly supported agricultural research program in Michigan
- serves more than agriculture
- research includes projects in forestry, fisheries, wildlife, parks and recreation, tourism, packaging, human nutrition, family and child ecology
- original staff of 6 scientists has expanded to 300+ scientists
- first budget of $15,000 has expanded to current operating budget of $35 million

of grave public consideration." This deforested area involved 15 counties in the northern half of the lower peninsula. Converting the infertile sandy soil to productive agricultural land was among the early challenges for a team of Experiment Station scientists.

The Michigan Central Railroad Co. donated 80 acres adjoining the village of Grayling to the Michigan Agricultural College for use as a field station. Kedzie was given responsibility for the Grayling station, where experiments focused on finding the grass best suited to the area's sandy soil. Willits reported 6,500 trees of 75 varieties had been planted at Grayling for forestry experiments.

Other plots of 5 to 10 acres were established at Walton, Baldwin, Harrison and Oscoda to test some of the 100 varieties of grasses Beal was gathering from Siberia, China, Japan, Europe, South America and Mexico.

Financial Report

Henry Reynolds, the Experiment Station secretary and treasurer, reported expenditures made from the $15,000 annual Hatch Act appropriation to the Experiment Station.

Salaries accounted for about $2,172, with each of the five department heads receiving $200 for the four-month period.

Building expenses totalled $3,000 and included construction of an experimental feed barn, a horticultural laboratory and an apiary. About $865 was spent on seeds and plants. Travel expenses came to less than $785.

Willits' Conclusion

In closing his first annual report, Willits wrote, "I can only add that each officer of the station entered upon his line of work with a zeal which is an augury of success."

New Dimensions in Agriculture Research

Obviously, a century of scientific research and societal change have reshaped the Experiment Station's structure and research agenda. The following Q. & A. segment with Robert Gast, current director, gives a flavor for the evolving role of what is now Michigan State University's agriculture—and natural resources—research program.

Q. Why do we still need an Agricultural Experiment Station?

A. Economic development in agriculture and natural resources areas is the primary reason. We were created because agriculture had no mechanism for conducting its own research and development. The Experiment Station's major role continues to be the rapid application of new information and technologies to address problems and opportunities in agriculture and natural resources industries.

Q. How has the AES research agenda changed over the past century?

A. It has shifted from an emphasis on increasing production to one of increasing production efficiency, while at the same time conserving our natural resources and protecting our environment. Society is saying it's not enough to consider the costs of technological inputs. We have to figure the costs of environmental protection, resource conservation and social impacts as well.

Q. Willits' Experiment Station budget was $15,000 appropriated by Congress. What could you do with that amount today?

A. We could cover the cost of one half-time graduate assistant for $15,000 today. Our appropriated budget now is about $25 million, with about 80 percent contributed by the State of Michigan. When the Hatch Act was passed in 1887, the Experiment Stations were intended to be joint federal/state partnerships. That has

changed so now states, on average, contribute 85 percent of AES funding.

There obviously has been an increased feeling at the federal level that AES programs are more of a local and state than a federal responsibility, perhaps because of the economic development aspects. The Experiment Station contributes to the economic well-being and quality of life in Michigan by providing viable research and development programs for agriculture and natural resources industries.

Q. How are AES research priorities determined?

A. In a broad sense, research priorities are established through extensive, ongoing planning processes at the national, regional and state levels. We apply those priorities to this Experiment Station by assessing voids that exist in basic research and the applied research needs of the agriculture and natural resources industries we are expected to serve.

Q. What surprises you about the AES today, compared to when you began your research career nearly 30 years ago?

A. The greater complexity of the issues facing agriculture and the AES. At the time I began my research career, the approach to agriculture research was centered largely around production. Now, all aspects of the food chain—from storage and processing to packaging, transportation and marketing—must be considered, as well as the environmental and social impacts associated with food production.

Q. What will the AES director be highlighting in the annual report a dozen years from now, in the year 2000?

A. I am confident that our agriculture and natural resources industries will become even more sophisticated and technologically complex. These industries will become increasingly involved in the use of computers and computer related technology in their management and production systems. And, while we can't be sure what the next breakthroughs in biotechnology will be, we can be sure they will occur. We will also be giving much greater attention to the issues of sustainable agriculture—such as what levels of chemical use we are willing to accept—and rural revitalization.

Perhaps most importantly, all of this will be occurring within the context of a global rather than a domestic economy.

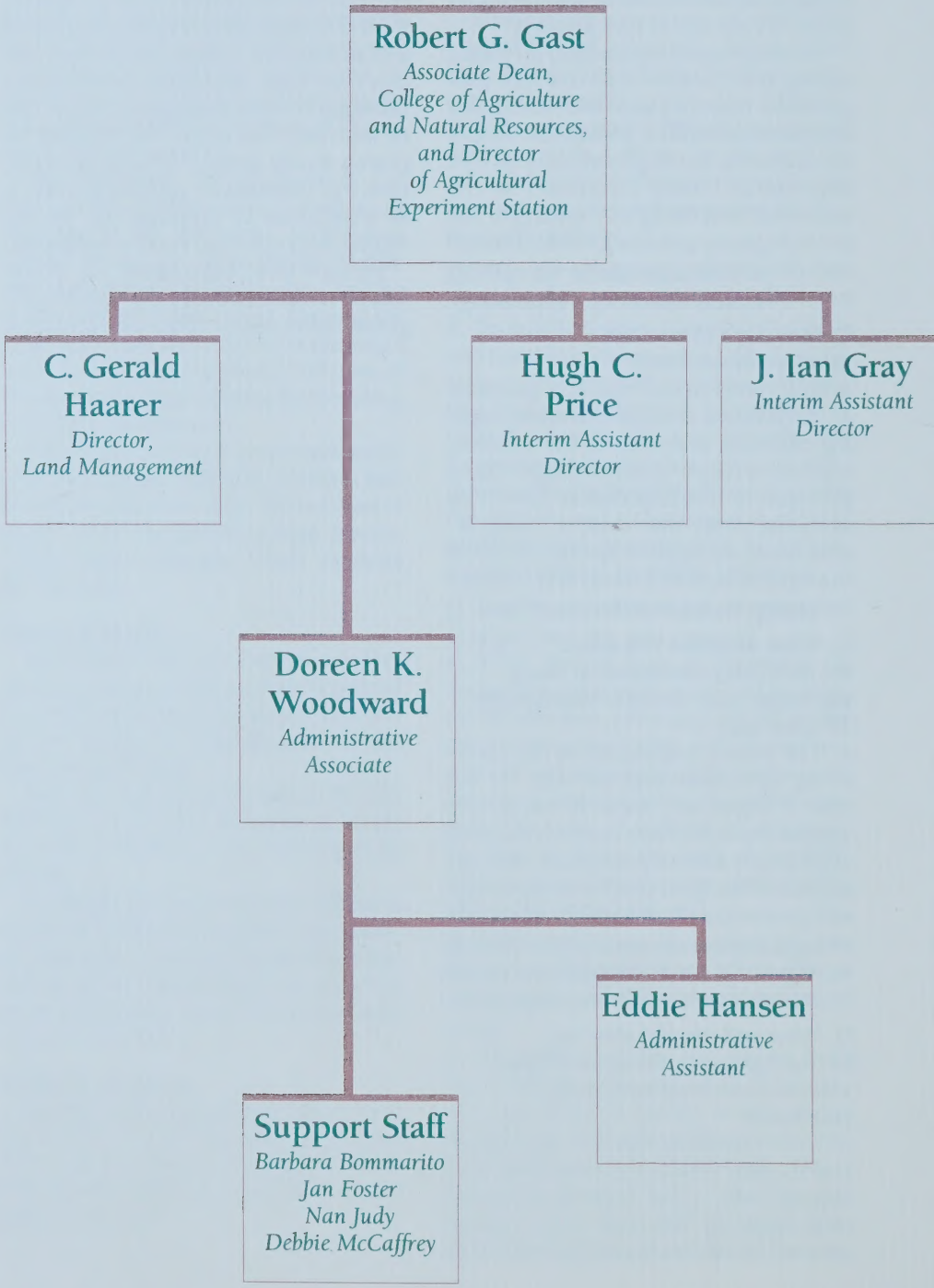
"I am confident that our agriculture and natural resources industries will continue to become increasingly sophisticated and technologically complex."

ROBERT GAST
Experiment Station director,
November 1987

Agricultural Experiment Station

Organizational Flow Chart

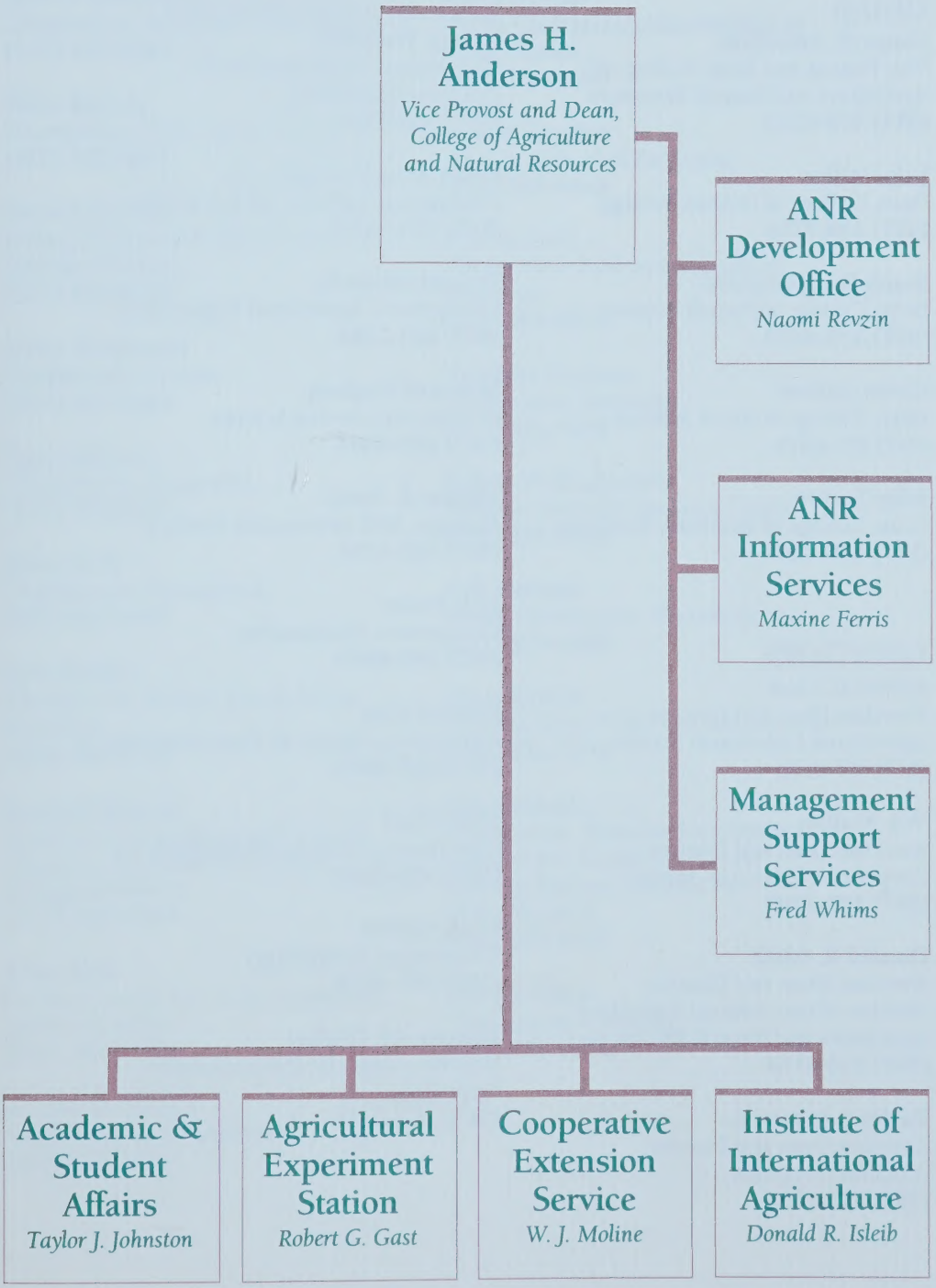
As of 11-1-87



College of Agriculture And Natural Resources

Dean's Office

As of 10-1-87



AES Affiliated Deans, Directors, and Unit Administrators

As of 10-1-87

DEANS

James H. Anderson
Vice Provost and Dean, College of Agriculture and Natural Resources
(517) 355-0233

Julia Miller
Dean, College of Human Ecology
(517) 355-7714

Frank Hoppensteadt
Dean, College of Natural Science
(517) 355-4473

Gwen Andrew
Dean, College of Social Science
(517) 355-6675

John Tasker
Dean, College of Veterinary Medicine
(517) 355-6509

DIRECTORS

Robert G. Gast
Associate Dean and Director, Agricultural Experiment Station
(517) 355-0123

W.J. Moline
Associate Dean and Director, Cooperative Extension Service
(517) 355-2308

Donald R. Isleib
Associate Dean and Director, Institute of International Agriculture Agriculture and Natural Resources
(517) 355-0174

Taylor J. Johnston
Associate Dean and Director, Academic Programs
(517) 355-0234

UNIT ADMINISTRATORS

Carroll Wamhoff
Chairperson, Agricultural and Extension Education
(517) 355-6580

Lester Manderscheid
Chairperson, Agricultural Economics
(517) 355-4567

Donald Edwards
Chairperson, Agricultural Engineering
(517) 353-7268

Maynard Hogberg
Chairperson, Animal Science
(517) 355-8384

Maxine S. Ferris
Manager, ANR Information Services
(517) 355-1758

Jack Preiss
Chairperson, Biochemistry
(517) 353-0804

Edward Klos
Chairperson, Botany & Plant Pathology
(517) 355-4680

Eldor Paul
Chairperson, Crop & Soil Sciences
(517) 355-0262

Mark Scriber
Chairperson, Entomology
(517) 355-4665

Lawrence J. Fischer
Director, Center for Environmental Toxicology
(517) 353-6469

Robert Griffore
Chairperson, Family & Child Ecology
(517) 355-7680

Niles Kevern
Chairperson, Fisheries & Wildlife
(517) 353-0647

Mark Uebersax
Acting Chairperson, Food Science & Human Nutrition
(517) 355-8476

Larry Tombaugh
Chairperson, Forestry
(517) 355-0093

Gary Manson
Chairperson, Geography
(517) 355-4649

John Kelly
Chairperson, Horticulture
(517) 355-5191

Jane Stolper
Chairperson, Human Environment & Design
(517) 355-7712

Bernard Knezek
Director of Agricultural and Natural Resources Programs for Kellogg Biological Station
(517) 353-4569

John Kirk
Acting Chairperson, Large Animal Clinical Sciences
(517) 355-9593

C. Gerald Haarer
Director, Land Management
(517) 355-3272

Loren Snyder
Acting Chairperson, Microbiology & Public Health
(517) 355-6465

Harold Hughes
Director, School of Packaging
(517) 353-6462

Phyllis Ford
Chairperson, Park and Recreation Resources
(517) 353-0822

Adalbert Koestner
Chairperson, Pathology
(517) 353-9160

Robert Hollingworth
Director, Pesticide Research Center
(517) 353-9430

Bob Pittman
Acting Chairperson, Physiology
(517) 355-4488

Hans Kende
Director, MSU-DOE Plant Research Lab
(517) 353-2270

Jon Bartholic
Chairperson, Resource Development; Coordinator, Center for Remote Sensing; Director, Institute for Water Research
(517) 355-3421

Marvin Olsen
Chairperson, Sociology
(517) 355-6632

Agricultural Experiment Station Outlying Stations

10-1-87

1. **East Lansing Field Research Facilities**
Established 1888
109 Agriculture Hall
East Lansing, MI 48824-1039
Phone: (517) 355-3272
C. Gerald Haarer
Director, Land Management

2. **Clarksville Horticultural Experiment Station**
Established 1974
Box 77A
9302 Portland Road
Clarksville, MI 48815
Phone: (517) 355-0239
or (616) 693-2193
Gerald Skeltis
Farm Manager

3. **Dunbar Forest Experiment Station**
Established 1925
Rt. 1, Box 179
Sault Ste. Marie, MI 49783
Phone: (906) 632-3932
John Bright
Resident Forester

4. **W.K. Kellogg Biological Station and W.K. Kellogg Forest**
Established 1928
3700 E. Gull Lake Drive
Hickory Corners, MI 49060
Phone: (616) 671-5117
Bernie Knezek (616) 671-2324
Director, Agricultural Programs
George Lauff (616) 671-2323
Director, Programs and Development

5. **Lake City Experiment Station**
Established 1928
Lake City, MI 49651
Phone: (616) 839-4608
Doug Nielsen
Farm Manager

6. **Montcalm Experimental Farm**
Established 1966
Rt. 1
Lakeview, MI 48850
Phone: (517) 365-3473
Richard Kitchen
Technician

7. **Muck Soils Research Farm**
Established 1941
Rt. 3
9422 E. Herbison Road
Laingsburg, MI 48848
Phone: (517) 641-4062
Ronald Gnagey
Field Research Technician

8. **Northwest Michigan Horticultural Experiment Station**
Established 1979
6686 Center Highway
Traverse City, MI 49684
Phone: (616) 946-1510
Charles Kesner
Supervisor
Bill Klein
Farm Manager

9. **Fred Russ Forest Experiment Station**
Established 1942
Decatur, MI 49046
Phone: (616) 782-5652
Greg Kowalewski
Resident Forester

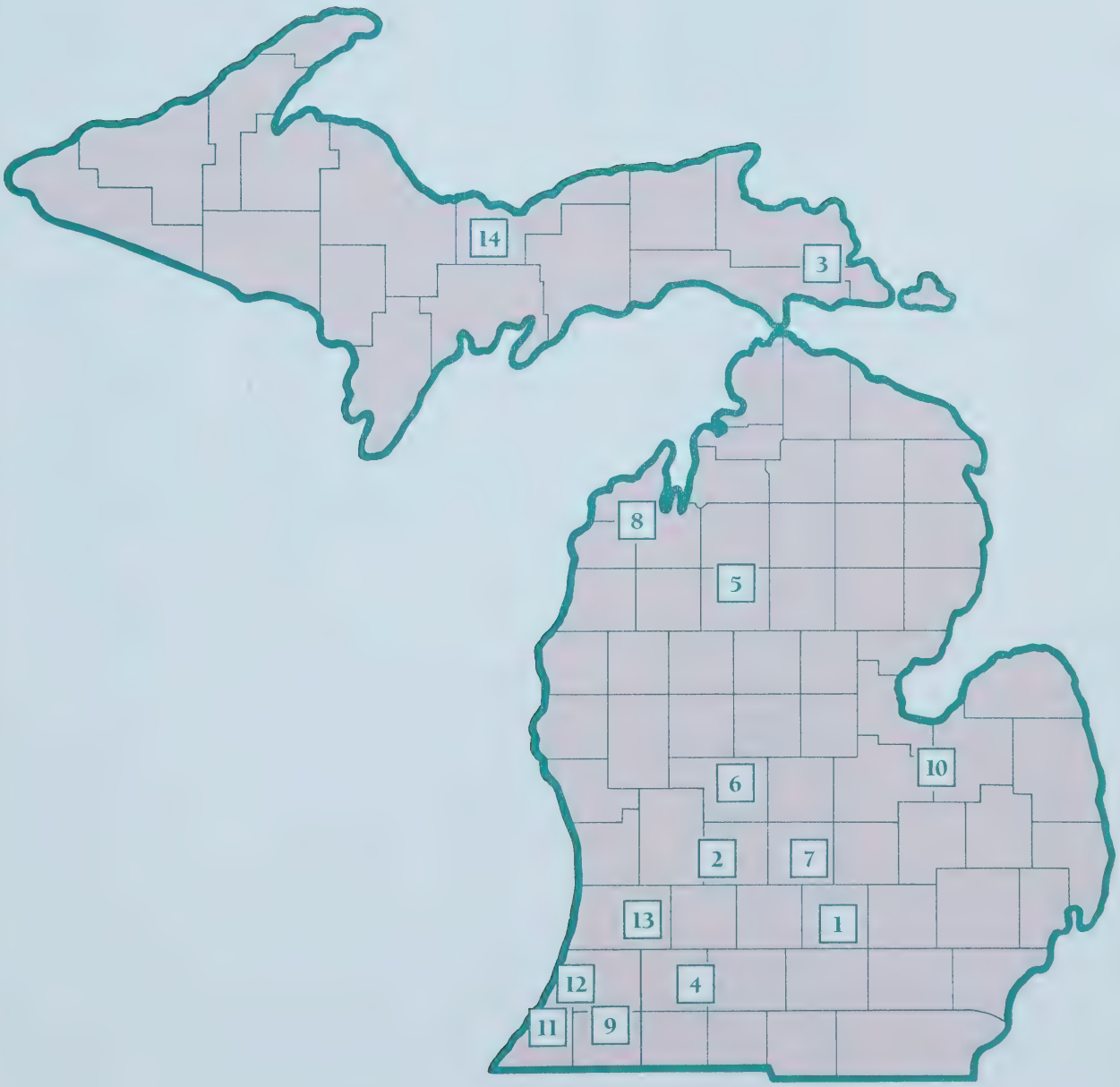
10. **Saginaw Valley Beet and Bean Research Farm**
Established 1971
3066 S. Thomas Road
Saginaw, MI 48603
Phone: (517) 781-1160
Paul Horny
Farm Manager

11. **Sodus Horticultural Experiment Station**
Established 1954
4440 River Road
P.O. Box 145
Sodus, MI 49126
Phone: (616) 925-3030
Jerry Grajauskis
Operations Supervisor

12. **SW Michigan Research & Extension Center**
Established 1987
1791 Hillandale Rd.
Benton Harbor, MI 49022
Phone: (616) 944-1076
James Ertman
Farm Manager

13. **Trevor Nichols Research Complex**
Established 1967
Rt. 4, 6227 M-89
Fennville, MI 49408
Phone: (517) 355-9615
or (616) 561-5040
Matthew Daly
Farm Manager

14. **Upper Peninsula Experiment Station**
Established 1899
Chatham, MI 49816
Phone: (906) 439-5114
Paul Naasz
Farm Manager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List of AES Scientists by Department

As of 10-1-87

The names listed here represent the faculty members who have an AES appointment and are in the tenure stream as of 10-1-87. The numbers shown under the category of "Other Faculty" indicate the number of other tenure stream faculty who are in that department but do not have an AES appointment.

KEY:

T = Teaching R = Research

E = Extension G = Grant

J = Joint Appointment in another college or department

12 = Professor

13 = Associate Professor

14 = Assistant Professor

Agricultural Economics

Ph: (517) 355-4563

NAME	RANK	FULL TIME EMPLOYEE—PERCENT T	R	E	G	J	AREA OF INTEREST
Black, J. Roy	12	0.20	0.80	0.00	0.00	0.00	Farm Management
Bonnen, James T.	12	0.15	0.85	0.00	0.00	0.00	Public Policy
Connor, Larry J.	12	0.30	0.70	0.00	0.00	0.00	Farm Management
Eicher, Carl K.	12	0.35	0.65	0.00	0.00	0.00	Int. Development
Ferris, John N.	12	0.15	0.20	0.65	0.00	0.00	Outlook & Prices
Hamm, Larry G.	14	0.10	0.25	0.65	0.00	0.00	Dairy Mktg. & Policy
Harsh, Stephen B.	12	0.15	0.20	0.65	0.00	0.00	Farm Management
Hoehn, John	14	0.20	0.40	0.00	0.00	0.40	Resource Development
Johnson, Glenn L.	12	0.35	0.65	0.00	0.00	0.00	Prod. Econ./Farm Mgt.
Myers, Robert S.	14	0.20	0.80	0.00	0.00	0.00	Intl. Trade & Price Analysis
Oehmke, James	14	0.25	0.75	0.00	0.00	0.00	Price Analysis
Ricks, Donald J.	12	0.10	0.20	0.70	0.00	0.00	Marketing
Riley, Harold M.	12	0.20	0.80	0.00	0.00	0.00	Mktg. Econ. Dvlpt.
Robison, Lindon J.	13	0.10	0.90	0.00	0.00	0.00	Production Econ.
Schmid, A. Allan	12	0.40	0.60	0.00	0.00	0.00	Land Econ./Pub. Pol.
Schwab, Gerald D.	12	0.30	0.20	0.50	0.00	0.00	Farm Management
Shaffer, James D.	12	0.30	0.70	0.00	0.00	0.00	Mktg./Ag. Policy
Sorenson, Vernon L.	12	0.15	0.20	0.65	0.00	0.00	Ag. Policy Trade
Stevens, Robert D.	12	0.15	0.40	0.00	0.00	0.45	Ag. Dev./Hlth. Econ.
Thompson, Stanley	13	0.65	0.35	0.00	0.00	0.00	Marketing
van Ravenswaay, Eileen	13	0.30	0.70	0.00	0.00	0.00	Pub. Pol./Food Safety
SUBTOTALS:		**5.05**	**11.30**	**3.80**	**0.00**	**0.85**	
Other Faculty:		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	
TOTALS:		**5.05**	**11.30**	**3.80**	**0.00**	**0.85**	

Agricultural Engineering

Ph: (517) 355-4720

NAME	RANK	FULL TIME EMPLOYEE—PERCENT T	R	E	G	J	AREA OF INTEREST
Bakker-Arkema, Fred	12	0.35	0.65	0.00	0.00	0.00	Grain Dry/Storage
Berglund, Kris	13	0.30	0.30	0.00	0.00	0.40	Biotech./Food Engr.
Bickert, William G.	12	0.00	0.20	0.80	0.00	0.00	Livestock Fac./Env.
Bralts, Vincent F.	13	0.30	0.50	0.00	0.00	0.20	Soil & Wtr./Intl. Pgm.
Brook, Roger C.	13	0.00	0.25	0.75	0.00	0.00	Post-Harv. Handling
Burkhardt, Thomas H.	12	0.60	0.25	0.00	0.00	0.15	Power & Mach. Systems & Storage
Gerrish, John B.	13	0.50	0.40	0.00	0.00	0.10	Elec. Robotics
Loudon, Theodore L.	12	0.00	0.30	0.70	0.00	0.00	Pollut. Mgmt./Irr.
Merva, George E.	12	0.50	0.50	0.00	0.00	0.00	Irrigation/Drng.
Mrozowski, Timothy	13	0.80	0.20	0.00	0.00	0.00	Bldg. Construction
Nurnberger, Fred	12	0.00	0.15	0.00	0.00	0.85	Climatology
Ofoli, Robert	14	0.50	0.50	0.00	0.00	0.00	Heat & Mass Transfer of Bio. Systems
Person, Howard L.	13	0.00	0.30	0.70	0.00	0.00	Ag. Structure
Segerlind, Larry L.	12	0.60	0.40	0.00	0.00	0.00	Finite Elem. Anly., CAD
Srivastava, Ajit K.	13	0.40	0.50	0.00	0.00	0.10	Power & Mach. Systems Hydraulics
Steffe, James F.	13	0.40	0.35	0.00	0.00	0.25	Food Engr./Rheology
Surbrook, Truman C.	12	0.15	0.25	0.00	0.00	0.60	Elec. Tech.
Van Ee, Gary R.	13	0.25	0.65	0.00	0.00	0.10	Fruit/Veg. Mech.
Wilkinson, Robert H.	13	0.15	0.15	0.60	0.00	0.10	Human Factors Engr./ Chem. Applics.
SUBTOTALS:		**5.80**	**6.80**	**3.55**	**0.00**	**2.85**	
Other Faculty:		**3.35**	**2.90**	**3.40**	**3.00**	**14.10**	
TOTALS:		**9.15**	**9.70**	**6.95**	**3.00**	**16.95**	

Ag. & Extension Education

Ph: (517) 355-6580

NAME	RANK	FULL TIME EMPLOYEE—PERCENT T	R	E	G	J	AREA OF INTEREST
Levine, S. Joseph	13	0.30	0.20	0.50	0.00	0.00	Faculty Development
SUBTOTALS		**0.30**	**0.20**	**0.50**	**0.00**	**0.00**	
Other Faculty:		**5.20**	**0.00**	**0.00**	**0.00**	**3.80**	
TOTALS:		**5.50**	**0.20**	**0.50**	**0.00**	**3.80**	

Animal Science

Ph: (517) 355-8383

NAME	RANK	FULL TIME EMPLOYEE—PERCENT T	R	E	G	J	AREA OF INTEREST
Allen, Michael	14	0.00	0.50	0.50	0.00	0.00	Forage Nutrition
Aulerich, Richard J.	12	0.00	0.75	0.25	0.00	0.00	Fur-bearing Animals
Balander, Richard J.	13	0.60	0.40	0.00	0.00	0.00	Avian Phys./Repro.
Bergen, Werner G.	12	0.20	0.80	0.00	0.00	0.00	Rum. Nutr./Grth. Biol.

Animal Science

Bucholtz, Herbert F.	12	0.00	0.20	0.80	0.00	0.00	Dairy Nutr./Mgmt.
Bursian, Steven	13	0.15	0.85	0.00	0.00	0.00	Avian Phys./Toxic.
Chang, Timothy S.	12	0.15	0.85	0.00	0.00	0.00	M&PH/Poultry Path.
Coe, Paul H.	13	0.00	0.20	0.00	0.00	0.80	Animal Health
Cook, Robert M.	12	0.20	0.80	0.00	0.00	0.00	Rum. Nutrition
Coussens, Paul M.	14	0.20	0.80	0.00	0.00	0.00	Molecular Biology
Emery, Roy S.	12	0.20	0.60	0.00	0.00	0.20	Rum. Nutrition
Ferris, Theodore A.	13	0.00	0.20	0.80	0.00	0.00	Breeding
Flegal, Cal J.	12	0.00	0.35	0.65	0.00	0.00	Avian Nutr./Mgmt.
Fogwell, Ralph L.	13	0.40	0.60	0.00	0.00	0.00	Physiology
Gill, John L.	12	0.50	0.50	0.00	0.00	0.00	Statistics Genet.
Hawkins, David R.	12	0.60	0.20	0.00	0.00	0.20	Beef Cattle Nutr.
Ireland, James J.	13	0.20	0.80	0.00	0.00	0.00	Physiology
Magee, William T.	12	0.30	0.50	0.00	0.00	0.20	Animal Breeding
Mao, Ivan Ling	12	0.30	0.70	0.00	0.00	0.00	Breeding
McGilliard, Lon D.	12	0.50	0.50	0.00	0.00	0.00	Breeding
Merkel, Robert A.	12	0.50	0.25	0.00	0.00	0.25	Growth Biology
Miller, Elwyn R.	12	0.05	0.80	0.00	0.00	0.15	Swine Nutrition
Polin, Donald	12	0.25	0.75	0.00	0.00	0.00	Avian Nutrition
Rahn, Allan P.	12	0.00	0.20	0.65	0.00	0.15	Mgmt. Agr. Econ.
Ringer, Robert K.	12	0.16	0.74	0.00	0.00	0.10	Avian Phys./Toxic.
Ritchie, Harlan D.	12	0.00	0.10	0.90	0.00	0.00	Beef Ctl. Nutr. Mgmt.
Rust, Steven	14	0.00	0.50	0.50	0.00	0.00	Beef Feedlot Nutr.
Stowe, Howard D.	12	0.00	0.45	0.00	0.00	0.55	Clinical Nutrition
Thulin, Andrew	14	0.15	0.15	0.70	0.00	0.00	Swine Nutr./Mgmt.
Tucker, H. Allen	12	0.20	0.80	0.00	0.00	0.00	Phys./Lactation
Ullrey, Duane E.	12	0.40	0.60	0.00	0.00	0.00	Animal Nutrition
Yokoyama, Melvin T.	12	0.15	0.85	0.00	0.00	0.00	Animal Nutr./Micro.
SUBTOTALS		**6.36**	**17.29**	**5.75**	**0.00**	**2.60**	
Other Faculty:		**3.40**	**0.15**	**3.72**	**0.00**	**3.03**	
TOTALS:		**9.76**	**17.44**	**9.47**	**0.00**	**5.63**	

Biochemistry

Phone (217) 333-1609

NAME	RANK	FULL TIME EMPLOYEE—PERCENT T	R	E	G	J	AREA OF INTEREST
Anderson, Richard L.	12	0.45	0.25	0.00	0.00	0.30	Carbohy. Metab.
Burton, Zachary	14	0.00	0.20	0.00	0.00	0.80	Molecular Biology
Deal, William C., Jr.	12	0.00	0.40	0.00	0.00	0.60	Phys. Biochem.
Fraker, Pamela J.	12	0.00	0.44	0.00	0.00	0.56	Immunology
Holland, John F.	12	0.00	0.80	0.00	0.00	0.20	Analytical Biochem.
Kaguni, Jon M.	14	0.00	0.80	0.00	0.00	0.20	Molecular Biology
Kindel, Paul K.	12	0.20	0.60	0.00	0.00	0.20	Plant Biochem.
Schindler, Melvin J.	13	0.00	0.35	0.00	0.00	0.65	Cell Biology

Biochemistry
(continued)

Tolbert, N. Edward	12	0.16	0.80	0.00	0.00	0.04	Plant Biochemistry
Triezenberg, Steven	14	0.00	0.20	0.00	0.00	0.80	Molecular Biology
Wang, John L.	12	0.00	0.20	0.00	0.00	0.80	Cell Biology
Watson, J. Throck	12	0.20	0.30	0.00	0.00	0.50	Analytical Biochem.
SUBTOTALS:		**1.01**	**5.34**	**0.00**	**0.00**	**5.65**	
Other Faculty:		**1.10**	**0.00**	**0.00**	**0.00**	**12.20**	
TOTALS:		**2.11**	**5.34**	**0.00**	**0.00**	**17.85**	

Botany and Plant Pathology

Ph: (517) 355-4683

		FULL TIME EMPLOYEE—PERCENT					
NAME	RANK	T	R	E	G	J	AREA OF INTEREST
Adams, Gerard C.	14	0.00	0.40	0.60	0.00	0.00	Plant Pathology
Fulbright, Dennis W.	13	0.00	1.00	0.00	0.00	0.00	Wheat Pathology
Hammerschmidt, Raymond	13	0.00	0.90	0.00	0.00	0.10	Plant Pathology
Hart, John H.	12	0.00	0.60	0.00	0.00	0.40	Plant Pathology
Hart, L. Patrick	13	0.00	0.50	0.50	0.00	0.00	Plant Pathology
Jones, Alan L.	12	0.00	0.50	0.50	0.00	0.00	Plant Pathology
Lacy, Melvyn L.	12	0.00	0.40	0.50	0.00	0.10	Plant Pathology
Lockwood, John L.	12	0.00	0.90	0.00	0.00	0.10	Plant Pathology
Murakishi, Harry H.	12	0.00	0.90	0.00	0.00	0.10	Plant Pathology
Ohlrogge, John	13	0.00	0.84	0.00	0.00	0.16	Plant Physiology
Ramsdell, Donald C.	12	0.00	0.50	0.50	0.00	0.00	Plant Virol. Path.
Safir, Gene R.	12	0.00	0.90	0.00	0.00	0.10	Plant Pathology
Scheffer, Robert P.	12	0.00	0.80	0.00	0.00	0.20	Plant Pathology
Sears, Barbara	14	0.00	0.25	0.00	0.00	0.75	Molecular Gen.
Somerville, Shauna	14	0.00	1.00	0.00	0.00	0.00	Plant Pathology
Stephens, Christine	13	0.00	0.39	0.61	0.00	0.00	Plant Pathology
Vargas, Joseph M., Jr.	12	0.00	0.50	0.15	0.00	0.35	Plant Pathology
SUBTOTALS:		**0.00**	**11.28**	**3.36**	**0.00**	**2.36**	
Other Faculty:		**0.00**	**0.00**	**0.00**	**0.50**	**10.50**	
TOTALS:		**0.00**	**11.28**	**3.36**	**0.50**	**12.86**	

Crop and Soil Sciences

Ph: (517) 355-0262

		FULL TIME EMPLOYEE—PERCENT					
NAME	RANK	T	R	E	G	J	AREA OF INTEREST
Adams, Wayne M.	12	0.25	0.75	0.00	0.00	0.00	Plant Breeding
Boyd, Stephen A.	13	0.25	0.75	0.00	0.00	0.00	Organic Chemistry
Branham, Bruce E.	14	0.25	0.75	0.00	0.00	0.00	Turfgrass Phys.
Chase, Richard W.	12	0.00	0.25	0.75	0.00	0.00	Crop Management
Christenson, Donald R.	12	0.00	0.50	0.50	0.00	0.00	Soil Fert. Mgmt.
Cress, Charles E.	12	0.90	0.10	0.00	0.00	0.00	Applied Statistics
Crum, James L.	14	0.60	0.25	0.00	0.00	0.15	Soil Class./Genesis

Crop & Soil Sciences
continued

Ellis, Boyd G.	12	0.50	0.50	0.00	0.00	0.00	Soil Chemistry
Erickson, A. Earl	12	0.13	0.87	0.00	0.00	0.00	Soil Physics
Everson, Everett H.	12	0.25	0.75	0.00	0.00	0.00	Plant Breeding
Foster, Eunice S.	14	0.85	0.15	0.00	0.00	0.00	Crop Physiology
Freed, Russell D.	13	0.25	0.50	0.00	0.00	0.25	Int. Agron./Plnt. Brdg.
Harpstead, Dale D.	12	0.24	0.62	0.14	0.00	0.00	Lv. of Abs./Intl. Ag.
Hesterman, Oran B.	14	0.00	0.25	0.75	0.00	0.00	Corn/Soybean Prod.
Isleib, Thomas G.	14	0.25	0.75	0.00	0.00	0.00	Soybean Breeding
Jacobs, Lee W.	12	0.00	0.50	0.50	0.00	0.00	Ext. Environ. Spc.
Kells, James F., Jr.	14	0.15	0.25	0.60	0.00	0.00	Weed Science
Knezek, B.D.	12	0.00	0.47	0.00	0.00	0.53	Micronut. Wst. Util.
Kunze, Raymond J.	12	0.50	0.50	0.00	0.00	0.00	Soil Physics
Leep, Richard H.	13	0.00	0.50	0.50	0.00	0.00	Soil Physics.
Mokma, Delbert L.	13	0.50	0.50	0.00	0.00	0.00	Soil Class./Genesis
Mortland, Max M.	12	0.50	0.50	0.00	0.00	0.00	Soil Chem. & Mineral.
Payne, Kenyon T.	12	0.25	0.25	0.00	0.00	0.50	Turfgrass Management
Penner, Donald	12	0.20	0.80	0.00	0.00	0.00	Crop Physiology
Pierce, J. Francis	14	0.00	0.50	0.50	0.00	0.00	Soil Mgmt. Systems
Renner, Karen A.	14	0.00	0.50	0.50	0.00	0.00	Weed Science
Rieke, Paul E.	12	0.00	0.35	0.50	0.00	0.15	Turfgrass Mgmt.
Ritchie, Joe. T.*	12	0.00	0.00	0.50	0.00	0.50	Soil Phys./Plt. Stress
Rossman, Elmer C.	12	0.25	0.75	0.00	0.00	0.00	Plant Brdg./Genet.
Smucker, A.J.	12	0.25	0.75	0.00	0.00	0.00	Soil Biophysics
Tesar, Milo B.	12	0.20	0.75	0.00	0.00	0.05	Past./Forage Crops
Thomashow, Michael	13	0.10	0.76	0.00	0.00	0.14	Plant & Microbial Molecular Genetics
Tiedje, James M.	12	0.25	0.60	0.00	0.00	0.15	Soil Microbiology
Vitosh, Maurice L.	12	0.00	0.30	0.70	0.00	0.00	Soil Fert. Mgmt.
Warncke, Darryl D.	13	0.00	0.50	0.50	0.00	0.00	Gmhs./Veg. Soil Fert.
SUBTOTALS:		**7.87**	**17.77**	**6.94**	**0.00**	**2.42**	
Other Faculty:		**0.10**	**1.40**	**0.50**	**1.00**	**0.00**	
TOTALS:		**7.97**	**19.17**	**7.44**	**1.00**	**2.42**	

*Nowlin Professor for Water Research

Entomology

Ph: (517) 355-4662

NAME	RANK	FULL TIME EMPLOYEE—PERCENT T	R	E	G	J	AREA OF INTEREST
Ayers, George S.	13	0.25	0.10	0.00	0.00	0.65	Pestic. Appl. Sci./Apic.
Bird, George W.	12	0.00	0.40	0.50	0.00	0.10	Agr. Nematology
Carlson, John D.	14	0.00	0.27	0.00	0.28	0.45	Agr. Meteorology
Edens, Thomas C.	13	0.00	0.20	0.00	0.00	0.80	Resc. Econ./Sust. Agr
Gage, Stuart H.	13	0.00	0.75	0.00	0.00	0.25	Env. Sys./Ent. Sur.
Grafius, Edward	13	0.00	0.50	0.50	0.00	0.00	Veg. Ins. Eco. Mgt.

Entomology
(continued)

Haynes, Dean L.	12	0.00	0.75	0.00	0.00	0.25	Insect Pop. Ecol.
Hoopingarner, Roger A.	12	0.00	0.10	0.70	0.00	0.20	Apic./Pollin
Howitt, Angus J.	12	0.00	0.25	0.75	0.00	0.00	Fruit Ins. Mgmt.
Matsumura, Fumio	12	0.00	0.90	0.00	0.00	0.10	Env. Toxicology
Merritt, Richard W.	12	0.00	0.50	0.00	0.00	0.50	Aquatic Entomology
Miller, James	13	0.00	0.50	0.00	0.00	0.50	Ins. Phys./Ecol. Attr.
Newson, Harold D.	12	0.00	0.25	0.30	0.00	0.45	Med. Entomology
Simmons, Gary A.	12	0.00	0.30	0.50	0.00	0.20	Forest Ins. Ecology
Smitley, David R.	14	0.00	0.40	0.60	0.00	0.00	Landscape Entomology
Stehr, Frederick W.	12	0.00	0.50	0.00	0.00	0.50	Ins. Ecol./Syst.
Whalon, Mark E.	13	0.00	0.75	0.00	0.00	0.25	Fruit Ins./Vectors
Zabik, Matthew	12	0.00	0.10	0.00	0.00	0.90	Env. Toxicology
SUBTOTALS:		**0.25**	**7.52**	**3.85**	**0.28**	**6.10**	
Other Faculty:		**0.00**	**0.00**	**0.00**	**0.00**	**8.00**	
TOTALS:		**0.25**	**7.52**	**3.85**	**0.28**	**14.10**	

Family and Child Ecology

Ph: (517) 355-7680

		FULL TIME EMPLOYEE—PERCENT					
NAME	RANK	T	R	E	G	J	AREA OF INTEREST
Brown, Jeanne	14	0.00	0.10	0.60	0.00	0.30	Human Dev. & Family
Bubolz, Margaret M.	12	0.00	0.30	0.00	0.00	0.70	Human Dev. & Family
Gladhart, Peter M.	13	0.00	0.25	0.00	0.00	0.75	Ext./Fam. Res. Mgmt.
Keefe, Dennis R.	14	0.00	0.25	0.00	0.00	0.75	Family Econ.
Keith, Joanne E.	13	0.00	0.10	0.80	0.00	0.10	Family Life
Schiamberg, Lawrence	12	0.00	0.25	0.00	0.00	0.75	Child Development
Soderman, Anne	13	0.00	0.25	0.75	0.00	0.00	Human Dev. & Family
Walker, Rosemary	13	0.00	0.25	0.00	0.00	0.75	Family Economics
SUBTOTALS:		**0.00**	**1.75**	**2.15**	**0.00**	**4.10**	
Other Faculty:		**0.00**	**0.00**	**3.35**	**0.00**	**11.65**	
TOTALS:		**0.00**	**1.75**	**5.50**	**0.00**	**15.75**	

Fisheries & Wildlife

Ph: (517) 355-4477

		FULL TIME EMPLOYEE—PERCENT					
NAME	RANK	T	R	E	G	J	AREA OF INTEREST
Garling, Donald L.	14	0.20	0.30	0.50	0.00	0.00	Aquaculture
Giesy, John P.	13	0.35	0.65	0.00	0.00	0.00	Toxicology
Greenberg, Larry A.	14	0.25	0.75	0.00	0.00	0.00	Fisheries
Hanson, Jeffrey E.	14	0.67	0.33	0.00	0.00	0.00	Resource Econ.
Haufler, Jonathon B.	13	0.50	0.50	0.00	0.00	0.00	Wildlf. Ecol. Forest
King, Darrell L.	12	0.55	0.45	0.00	0.00	0.00	Limnology
Liston, Charles R.	13	0.50	0.50	0.00	0.00	0.00	Ichtyol. Ecol.
McNabb, Clarence D.	12	0.50	0.50	0.00	0.00	0.00	Limnol. Ecol.

Fisheries & Wildlife
(continued)

Peyton, R. Benny	13	0.70	0.30	0.00	0.00	0.00	Environ. Education
Prince, Harold H.	12	0.55	0.45	0.00	0.00	0.00	Waterfowl
Taylor, William W.	13	0.50	0.50	0.00	0.00	0.00	Fisheries
Winterstein, Scott R.	14	0.50	0.50	0.00	0.00	0.00	Wildlife Biometry
SUBTOTALS:		**5.77**	**5.73**	**0.50**	**0.00**	**0.00**	
Other Faculty:		**1.55**	**0.00**	**0.80**	**0.00**	**0.00**	
TOTALS:		**7.32**	**5.73**	**1.30**	**0.00**	**0.00**	

Food Science

Ph: (517) 355-8474

		FULL TIME EMPLOYEE—PERCENT					
NAME	RANK	T	R	E	G	J	AREA OF INTEREST
Booren, Alden M.	13	0.10	0.15	0.75	0.00	0.00	Meat/Poultry/Fish
Cash, Jerry N.	12	0.00	0.25	0.75	0.00	0.00	Fruit/Veg. Products
Gray, J. Ian	12	0.40	0.35	0.00	0.00	0.25	Food Chemistry
Keszi-Filadelfi, Mary Ann	14	0.80	0.20	0.00	0.00	0.00	Sensory Eval./ Flavor Chem.
Linz, John E.	13	0.50	0.50	0.00	0.00	0.00	Food Microbiology
Markakis, Pericles	12	0.25	0.75	0.00	0.00	0.00	Food/Veg. Chemistry
Partridge, John A.	14	0.75	0.25	0.00	0.00	0.00	Dairy Technology
Pestka, James J.	13	0.50	0.50	0.00	0.00	0.00	Food Microbiology
Price, James F.	12	0.50	0.50	0.00	0.00	0.00	Meat/Poultry Prod.
Smith, Denise M.	14	0.40	0.60	0.00	0.00	0.00	Poultry/Egg Prod.
Stine, Charles M.	12	0.80	0.20	0.00	0.00	0.00	Dairy Chemistry
Wishnetsky, Theodore	13	0.25	0.25	0.50	0.00	0.00	Fruit/Veg. Products
SUBTOTALS:		**5.25**	**4.50**	**2.00**	**0.00**	**0.25**	
Other Faculty:		**0.00**	**0.00**	**0.60**	**0.00**	**0.40**	
TOTALS:		**5.25**	**4.50**	**2.60**	**0.00**	**0.65**	

Forestry

Ph: (517) 355-0090

		FULL TIME EMPLOYEE—PERCENT					
NAME	RANK	T	R	E	G	J	AREA OF INTEREST
Dickmann, Donald I.	12	0.40	0.60	0.00	0.00	0.00	Tree Physiology
Hanover, James W.	12	0.30	0.70	0.00	0.00	0.00	Forest Genetics
Hart, James B., Jr.	13	0.50	0.50	0.00	0.00	0.00	Forest Soils
Huber, Henry A.	12	0.00	0.10	0.90	0.00	0.00	Forest Products
Keathley, Daniel	13	0.25	0.75	0.00	0.00	0.00	Forest Genetics
Kielbaso, Julian J.	12	0.60	0.40	0.00	0.00	0.00	Urban Forestry
Latagne, Douglas O.	14	0.00	0.20	0.80	0.00	0.00	Silviculture
Leefers, Larry	14	0.50	0.50	0.00	0.00	0.00	Forest Economics
Manthy, Robert S.	12	0.50	0.50	0.00	0.00	0.00	Forest Economics
Marty, Robert J.	12	0.70	0.30	0.00	0.00	0.00	Forest Management
Potter, Karen	14	0.10	0.30	0.60	0.00	0.00	Forest Economics

Forestry
(continued)

Pregitzer, Kurt S.	13	0.40	0.60	0.00	0.00	0.00	Forest Ecology
Ramm, Carl W.	13	0.40	0.60	0.00	0.00	0.00	Forest Biometrics
Sliker, Alan W.	12	0.30	0.70	0.00	0.00	0.00	Wood Science
Suchsland, Otto	12	0.20	0.80	0.00	0.00	0.00	Wood Science
Vincent, Jeffrey R.	14	0.60	0.40	0.00	0.00	0.00	International Econ.
SUBTOTALS:		**5.75**	**7.95**	**2.30**	**0.00**	**0.00**	
Other Faculty:		**0.20**	**0.00**	**0.80**	**0.00**	**0.00**	
TOTALS:		**5.95**	**7.95**	**3.10**	**0.00**	**0.00**	

Geography

Ph: (517) 355-4649

		FULL TIME EMPLOYEE—PERCENT					
NAME	RANK	T	R	E	G	J	AREA OF INTEREST
Chubb, Michael	12	0.00	0.33	0.00	0.00	0.67	Recreational Geography
SUBTOTALS		**0.00**	**0.33**	**0.00**	**0.00**	**0.67**	
Other Faculty:		**10.32**	**11.61**	**0.00**	**0.00**	**3.87**	
TOTALS:		**10.32**	**11.94**	**0.00**	**0.00**	**4.54**	

Horticulture

Ph: (517) 355-5191

		FULL TIME EMPLOYEE—PERCENT					
NAME	RANK	T	R	E	G	J	AREA OF INTEREST
Biernbaum, John	14	0.45	0.10	0.00	0.00	0.45	Plant Phys./Flori.
Bukovac, Martin J.	12	0.10	0.90	0.00	0.00	0.00	Plant Phys./Pomol.
Cameron, Arthur C.	13	0.30	0.70	0.00	0.00	0.00	Plnt. Phys./Lnds. Hort.
Carlson, William H.	12	0.15	0.35	0.50	0.00	0.00	Floriculture
Dennis, Frank G., Jr.	12	0.60	0.40	0.00	0.00	0.00	Plant Phys./Pomol.
Dilley, David R.	12	0.20	0.80	0.00	0.00	0.00	Posthar. Phys./Pomol.
Ewart, Lowell C.	12	0.10	0.60	0.00	0.00	0.30	Floral/Onion Brdg.
Flore, James A.	12	0.35	0.65	0.00	0.00	0.00	Plant Phys./Pomol.
Grumet, Rebecca	14	0.10	0.90	0.00	0.00	0.00	Veg. Brdg./Genetics
Hancock, James F.	13	0.10	0.90	0.00	0.00	0.00	Sm. Frt. Brdg./Genetics
Hanson, Eric J.	14	0.00	0.35	0.65	0.00	0.00	Pomol. Small Fruits
Heins, Royal D.	13	0.30	0.70	0.00	0.00	0.00	Plant Phys./Flor.
Herner, Robert C.	12	0.35	0.65	0.00	0.00	0.00	Psthar. Phys./Veg. Crop
Howell, Gordon S.	12	0.15	0.80	0.00	0.00	0.05	Plt. Phys./Vitic./Enology
Hull, Jerome, Jr.	12	0.00	0.30	0.70	0.00	0.00	Pomology
Iezonni, Amy F.	13	0.20	0.80	0.00	0.00	0.00	Fruit Breed./Genet.
Perry, Ronald L.	13	0.00	0.50	0.50	0.00	0.00	Pomol./Rootstocks
Price, Hugh C.	12	0.00	0.50	0.50	0.00	0.00	Vegetable Crops
Putnam, Alan R.	12	0.35	0.65	0.00	0.00	0.00	Plt. Phys./Weed Sci.
Ries, Stanley K.	12	0.20	0.80	0.00	0.00	0.00	Plant Physiology
Sink, Kenneth C.	12	0.25	0.75	0.00	0.00	0.00	Genet./Plant Brdg.

Horticulture
(continued)

Widders, Irvin E.	13	0.25	0.75	0.00	0.00	0.00	Veg. Physiology
Zandstra, Bernard H.	13	0.00	0.30	0.70	0.00	0.00	Vegetable Crops
SUBTOTALS:		**4.50**	**14.15**	**3.55**	**0.00**	**0.80**	
Other Faculty:		**1.20**	**0.00**	**1.30**	**0.15**	**1.35**	
TOTALS:		**5.70**	**14.15**	**4.85**	**0.15**	**2.15**	

Human Environment & Design

Ph. (517) 355-7712

		FULL TIME EMPLOYEE—PERCENT					
NAME	RANK	T	R	E	G	J	AREA OF INTEREST
Graham, Richard L.	13	0.75	0.25	0.00	0.00	0.00	Interior Design (Conserv. & Preserv.)
Slocum, Ann C.	13	0.75	0.25	0.00	0.00	0.00	Clothing & Textiles
Sontag, M. Suzanne	12	0.75	0.25	0.00	0.00	0.00	Clothing & Textiles
Sternquist (Witter), Brenda	13	0.75	0.25	0.00	0.00	0.00	Tourism/Merc. Mgmt.
SUBTOTALS:		**3.00**	**1.00**	**0.00**	**0.00**	**0.00**	
Other Faculty:		**16.75**	**0.00**	**2.50**	**0.00**	**0.00**	
TOTALS:		**19.75**	**1.00**	**2.50**	**0.00**	**0.00**	

Human Nutrition

Ph: (517) 355-8474

		FULL TIME EMPLOYEE—PERCENT					
NAME	RANK	T	R	E	G	J	AREA OF INTEREST
Bennink, Maurice R.	12	0.50	0.50	0.00	0.00	0.00	Nutrition
Bond, Jenny T.	12	0.60	0.40	0.00	0.00	0.00	Nutrition
Chenoweth, Wanda L.	12	0.75	0.25	0.00	0.00	0.00	Nutrition
Hoerr, Sharon M.	14	0.75	0.25	0.00	0.00	0.00	Community Nutrition
Ott, Dana B.	14	0.50	0.50	0.00	0.00	0.00	Foods & Nutrition
Romsos, Dale R.	12	0.30	0.70	0.00	0.00	0.00	Lipid Metabolism
Sawyer, Carol A.	13	0.75	0.25	0.00	0.00	0.00	Food Service Mgmt.
Schemmel, Rachelle A.	12	0.70	0.30	0.00	0.00	0.00	Nutrition
Song, Won	14	0.75	0.25	0.00	0.00	0.00	Nutrition
Zabik, Mary E.	12	0.50	0.50	0.00	0.00	0.00	Foods
Zile, Maija H.	13	0.50	0.50	0.00	0.00	0.00	Nutrition
SUBTOTALS:		**6.60**	**4.40**	**0.00**	**0.00**	**0.00**	
Other Faculty:		**2.40**	**0.00**	**0.35**	**0.00**	**0.25**	
TOTALS:		**9.00**	**4.40**	**0.35**	**0.00**	**0.25**	

Kellogg Biological Station

Ph: (517) 353-9445

		FULL TIME EMPLOYEE—PERCENT					
NAME	RANK	T	R	E	G	J	AREA OF INTEREST
Bush, Guy L.	12	0.00	0.10	0.00	0.00	0.90	Genetics
SUBTOTALS:		**0.00**	**0.10**	**0.00**	**0.00**	**0.90**	
Other Faculty:		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	
TOTALS:		**0.00**	**0.10**	**0.00**	**0.00**	**0.90**	

Large Animal Clinical Sciences

Ph: (517) 355-9593

NAME	RANK	FULL TIME EMPLOYEE—PERCENT T	R	E	G	J	AREA OF INTEREST
Baker, John	14	0.00	0.20	0.00	0.00	0.80	Bov. Resp. Diseases
Herdt, Thomas H.	13	0.00	0.25	0.00	0.00	0.75	Nutr. & Metabolic Diseases of Cattle
Kaneene, John	13	0.00	0.15	0.00	0.00	0.85	Epidem./Dis. Impact
Nachreiner, Raymond F.	12	0.00	0.25	0.00	0.00	0.75	Clin. Endocrinology
Robinson, Norman E.	12	0.00	0.33	0.00	0.00	0.67	Respir. Physiology
Stowe, Howard D.	12	0.00	0.30	0.00	0.00	0.70	Clinical Nutrition
Thacker, Brad J.	14	0.00	0.39	0.00	0.00	0.61	Swine Medicine
SUBTOTALS:		**0.00**	**1.87**	**0.00**	**0.00**	**5.13**	
Other Faculty:		**0.00**	**0.00**	**2.10**	**18.00**	**1.10**	
TOTALS:		**0.00**	**1.87**	**2.10**	**18.00**	**6.23**	

Microbiology & Public Health

Ph: (517) 355-6463

NAME	RANK	FULL TIME EMPLOYEE—PERCENT T	R	E	G	J	AREA OF INTEREST
Breznak, John A.	12	0.00	0.30	0.00	0.00	0.70	Microbial Ecology
Dazzo, Frank B.	13	0.00	0.80	0.00	0.00	0.20	Microbial Ecology
Dodgson, Jerry B.	13	0.00	0.35	0.00	0.00	0.65	Molecular Biology
Hausinger, Robert P.	14	0.00	0.40	0.00	0.00	0.60	Microbiology
Klug, Michael J.	12	0.00	0.25	0.00	0.00	0.75	Microbial Ecology
Reddy, C. Adinarayana	12	0.00	0.50	0.00	0.00	0.50	Microbiology
Tiedje, James M.	12	0.00	0.15	0.00	0.00	0.85	Soil Microbiology
Uffen, Robert L.	12	0.00	0.49	0.00	0.00	0.51	Microbial Physiology
Velicer, Leland F.	12	0.00	0.30	0.00	0.00	0.70	Virology
Williams, Jeffrey F.	12	0.00	0.40	0.00	0.00	0.60	Parasitology
SUBTOTALS:		**0.00**	**3.94**	**0.00**	**0.00**	**6.06**	
Other Faculty:		**15.00**	**15.00**	**0.00**	**0.00**	**0.00**	
TOTALS:		**15.00**	**18.94**	**0.00**	**0.00**	**6.06**	

Packaging

Ph: (517) 355-9580

NAME	RANK	FULL TIME EMPLOYEE—PERCENT T	R	E	G	J	AREA OF INTEREST
Giacin, Jack R.	12	0.50	0.50	0.00	0.00	0.00	Packaging
Harte, Bruce	13	0.75	0.25	0.00	0.00	0.00	Packaging
Lee, Julian	14	0.80	0.20	0.00	0.00	0.00	Packaging
SUBTOTALS:		**2.05**	**0.95**	**0.00**	**0.00**	**0.00**	
Other Faculty:		**4.05**	**0.95**	**0.00**	**0.00**	**0.00**	
TOTALS:		**6.10**	**1.90**	**0.00**	**0.00**	**0.00**	

Park & Recreation Resources

Ph: (517) 353-5190

NAME	RANK	FULL TIME EMPLOYEE—PERCENT T	R	E	G	J	AREA OF INTEREST
Fridgen, Joseph D.	13	0.40	0.60	0.00	0.00	0.00	Leisure/Env. Perc.
Holecek, Donald F.	12	0.00	0.50	0.50	0.00	0.00	Res. Econ./Tourism
McDonough, Maureen H.	14	0.35	0.15	0.50	0.00	0.00	Environmental Interp.
Stynes, Daniel J.	13	0.50	0.50	0.00	0.00	0.00	Sys. Analysis & Plan.
SUBTOTALS:		**1.25**	**1.75**	**1.00**	**0.00**	**0.00**	
Other Faculty:		**0.00**	**0.00**	**0.00**	**0.00**	**0.00**	
TOTALS:		**1.25**	**1.75**	**1.00**	**0.00**	**0.00**	

Pathology

Ph: (517) 353-9160

NAME	RANK	FULL TIME EMPLOYEE—PERCENT T	R	E	G	J	AREA OF INTEREST
Padgett, George A.	12	0.00	0.25	0.00	0.00	0.75	Comp. Veterinary Path.
Patterson, Jon	12	0.00	0.50	0.00	0.00	0.50	Vet. Pathology of Infectious Dis./Ani.
Sleight, Stuart D.	12	0.00	0.70	0.00	0.00	0.30	Toxicologic Path.
Trapp, Allan L.	12	0.00	0.10	0.00	0.00	0.90	Diag. Veterinary Path.
Waxler, Glenn L.	12	0.00	0.25	0.00	0.00	0.75	Gastrointestinal Veterinary Path.
SUBTOTALS:		**0.00**	**1.80**	**0.00**	**0.00**	**3.20**	
Other Faculty:		**8.49**	**1.66**	**0.50**	**0.00**	**1.00**	
TOTALS:		**8.49**	**3.46**	**0.50**	**0.00**	**4.20**	

Physiology

Ph: (517) 355-6475

NAME	RANK	FULL TIME EMPLOYEE—PERCENT T	R	E	G	J	AREA OF INTEREST
Dukelow, W. Richard	12	0.00	0.42	0.00	0.00	0.58	Repro. Physiology
Hootman, Seth	14	0.00	0.50	0.00	0.00	0.50	Cellular Physiology
Zipser, Birgit	13	0.00	0.47	0.00	0.00	0.53	Cell Biology
SUBTOTALS:		**0.00**	**1.39**	**0.00**	**0.00**	**1.61**	
Other Faculty:		**0.00**	**18.30**	**0.00**	**0.00**	**1.15**	
TOTALS:		**0.00**	**19.69**	**0.00**	**0.00**	**2.76**	

Resource Development

Ph: (517) 355-3421

NAME	RANK	FULL TIME EMPLOYEE—PERCENT T	R	E	G	J	AREA OF INTEREST
Axinn, George	12	0.14	0.16	0.00	0.70	0.00	Comm. & Reg. Devpt.
Bronstein, Daniel A.	12	0.60	0.40	0.00	0.00	0.00	Env. Policy & Law
Chappelle, Daniel E.	12	0.60	0.07	0.00	0.00	0.33	Res. Econ. & Pol.
Dersch, Eckhart	12	0.25	0.10	0.65	0.00	0.00	Nat. Res. Mgmt.
Edens, Thomas C.	14	0.00	0.80	0.00	0.00	0.20	Res. Econ. & Pol.

Resource Development

(continued)

Fear, Frank A.	13	0.75	0.25	0.00	0.00	0.00	Comm. & Reg. Dev.
Kakela, Peter J.	13	0.20	0.60	0.20	0.00	0.00	Nat. Res. Mgmt.
Kimball, William J.	12	0.20	0.10	0.70	0.00	0.00	Comm. & Reg. Dev.
Nickel, Paul E.	12	0.75	0.25	0.00	0.00	0.00	Res. Econ. & Pol.
Schultink, Gerhardus	14	0.13	0.13	0.00	0.74	0.00	Nat. Res. Mgmt.
Thullen, Manfred	12	0.02	0.16	0.00	0.00	0.82	Comm. & Reg. Dev.
Vlasin, Ray	12	0.30	0.30	0.40	0.00	0.00	Comm. & Reg. Devpt.
SUBTOTALS:		**3.94**	**3.32**	**1.95**	**1.44**	**1.35**	
Other Faculty:		**2.27**	**0.83**	**0.90**	**0.00**	**0.00**	
TOTALS:		**6.21**	**4.15**	**2.85**	**1.44**	**1.35**	

Sociology

Ph: (517) 355-6640

		FULL TIME EMPLOYEE—PERCENT					
NAME	RANK	T	R	E	G	J	AREA OF INTEREST
Beegle, J. Allan	12	0.00	0.50	0.00	0.00	0.50	Population Changes
Harris, Craig K.	13	0.00	0.50	0.00	0.00	0.50	Soc. of Agriculture
Johnson, Nan E.	12	0.00	0.50	0.00	0.00	0.50	Demography
Morrison, Denton	12	0.00	0.50	0.00	0.00	0.50	Environmental Soc.
Schwarzweller, Harry K.	12	0.00	0.50	0.00	0.00	0.50	Soc. of Agriculture
SUBTOTALS:		**0.00**	**2.50**	**0.00**	**0.00**	**2.50**	
Other Faculty:		**21.50**	**0.50**	**0.00**	**0.00**	**0.00**	
TOTALS:		**21.50**	**3.00**	**0.00**	**0.00**	**2.50**	

GRAND SUBTOTALS:	**64.75**	**134.93**	**41.20**	**1.72**	**49.40**	
GRAND TOTALS:	**161.63**	**188.23**	**62.02**	**24.37**	**121.80**	

List of Active AES Projects* by Department

**Signifies Regional Research Project*

As of October 1, 1987

Agricultural Economics

Project 442	Economics of Agricultural Development And Change	Johnson, G.L.
Project 991	Agricultural Institutions, Decision Processes And Information Systems	Bonnen, J.T.
Project 996	Assessments Of Consumer Reactions To New Food Products And Marketing Services	Zehner, M.D.
Project 1046	Analysis Of Agricultural Production And Farm Level Marketing Systems	Black, J.R.
Project 1079	Health Care Systems As They Serve Rural People	Stevens, R.D.
Project 1197	Economic And Policy Factors Affecting Domestic And International Markets For U.S. Agricultural Products	Sorenson, V.L.
Project 1254*	Effect Of Change In Transportation On Performance Of The U.S. Agricultural Transportation System	Thompson, S.R.
Project 1329	Improved Fruit And Vegetable Marketing Systems	Ricks, D.J.
Project 1372	Economic Performance Of Natural Resource Management Institutions In The Context of Michigan's Economic Future	Hoehn, J.
Project 1403	A Study Of Regulatory Decision-Making On Toxic Substances In The Food System	van Ravenswaay, E.
Project 1449*	An Economic Analysis Of Risk Management Strategies For Agricultural Production Firms	Robison, L.
Project 1467*	Implications Of Emerging Policy Issues And Market Developments For The North Central Dairy Industry	Hamm, L.G.
Project 1475	Modeling Responses Of Growing Swine To Environmental And Nutritional Conditions	Schwab, G.
Project 1498	Determinants Of Farm Size And Structure In North Central Areas Of The U.S.	Robison, L.
Project 1502	The Performance Of Coordinating Functions And Institutions Of The U.S. Food System	Shaffer, J.D.
Project 1505	Improving Economic And Marketing Intelligence In The Food System	Ferris, J.
Project 1508	Ownership And Investment In Agriculture And Rural Communities	Schmid, A.A.
Project 1518*	Benefits And Costs In Natural Resource Planning	Schmid, A.
Project 1519*	Private Strategies, Public Policies, And Food System Performance	van Ravenswaay, E.
Project 3083	Tactical Decision Making For And The Application Of Computer And Communications Technology And Control Theory To Michigan Farms, Agribusiness, And Natural Resource Firms	Harsh, S.B
Project 3131	Agricultural Economics Research: Problems Of Less Developed Countries	Weber, M.

Agricultural Engineering

Project 336	Processing Of Biological Products	Bakker-Arkema, F.W.
Project 1050*	Principles And Technology For Handling And Sorting Fruits And Vegetables	Segerlind, L.J.
Project 1232	Mechanical Harvesting, Handling, Processing, And Storage Systems For Fruits And Vegetables	Ledebuhr, R.
Project 1245	Improvement Of Thermal Processes For Foods	Steffe, J.
Project 1361*	Marketing And Delivery Of Quality Cereals And Oilseeds In Domestic And Foreign Markets	Bakker-Arkema, F.W.
Project 1425	Robotics In Agriculture	Gerrish, J.B.
Project 1427*	Irrigation Scheduling Methods For Efficient Water And Energy Use	Bralts, V.F.
Project 1429	Minimizing Energy Usage While Optimizing Environmental Conditions In Swine Confinement Systems	Person, H.L.
Project 1431*	Trickle Irrigation In Humid Regions	Bralts, V.
Project 1465*	Corn And Soybean Response To Drainage	Merva, G.E.
Project 1495	Spectroscopy Applied To Food And Biochemical Engineering	Berglund, K.
Project 3070	Climatology Of Michigan	Nurnberger, F.V.
Project 3112	Micro Modelling Of Appropriate Agricultural Mechanization Systems In Developing Countries	Esmay, M.L.
Project 3142	Land Management Effects On Water Quality	Loudon, T.L.
Project 3177	Crop Properties Related To Machine Design And Performance	Srivastava, A.K.
Project 3178	Development Of Machine Concepts For Mechanized Agriculture	Ledebuhr, R.L.

Animal Science

Project 44	Biological And Biochemical Effects Of Certain Nutritional And Physical Factors On Swine	Miller, E.R.
Project 102*	Improving Dairy Cattle Through Breeding With Special Emphasis On Selection	McGilliard, L.D.
Project 721	Basic And Test Studies Utilizing Avian Species Other Than Poultry As Pilot Research Animals	Balander, R.
Project 797	Reproductive Physiology, Endocrinology, And Cardiovascular Physiology In Aves	Ringer, R.K.
Project 859	Hormonal Control Of Reproduction In Cattle, Sheep And Swine	Dukelow, W.R.
Project 1039	Fur Animal Studies (Mink)	Aulerich, R.J.
Project 1120*	Improvement Of Beef Cattle Through Breeding Methods	Magee, W.T.
Project 1156*	Improving Dairy Herd Management Practices	Mellenburger, R.
Project 1163	Factors Controlling Growth And Lactation	Tucker, H.A.
Project 1178	Breeding Strategies To Maximize Economic Gain In Dairy Cattle Production	Mao, I.L.
Project 1182*	Factors Regulating Protein Synthesis, Degradation, And Growth In Skeletal Muscle	Bergen, W.G.
Project 1196*	Methods For Improvement Of Fertility In Cows Postpartum	Fogwell, R.L.
Project 1226	Protein And Amino Acid Nutrition And Metabolism In Ruminants	Bergen, W.G.
Project 1244	Rumen Microbial Fermentation Of Forages And Crop And Processing Residue: Phenolic Compounds	Yokoyama, M.T.

Animal Science
(continued)

Project 1278	Improvement Of Design And Analysis Of Animal Experiments	Gill, J.L.
Project 1291*	Optimizing The Nutritional Utilization Of Forages By Dairy Cattle	Thomas, J.W.
Project 1299	Mechanism Of Testosterone And Growth Hormone Action On Muscle Growth	Merkel, R.A.
Project 1315	Production Of Steroids, Inhibin And Gonadotropins During Development Of Dominant Follicles In Cattle	Ireland, J.J.
Project 1318	Utilization Of Fiber By Ruminants	Cook, R.M.
Project 1433	Biological, Biochemical, Nutritional And Environmental Factors Impacting On Avian Growth, Reproduction And Metabolism	Polin, D.
Project 1437	Increasing Milk Solids Secretion	Emery, R.S.
Project 1445*	Redirecting The Nutrient Flow In Cows For Maximum Milk Production	Emery, R.S.
Project 1450	Poultry Disease Studies	Chang, T.
Project 1463*	The Control Of Food And Water Intake In Poultry	Polin, D.
Project 1521*	Metabolic Relationships In Supply Of Nutrients For Lactating Cows	Emery, R.
Project 3014	Maximum Utilization Of Michigan Grown Roughages For Finishing Cattle	Rust, S.R.
Project 3047	Feeding And Management Regimes For Efficient Utilization Of Michigan Feedstuffs By Beef Cattle	Ritchie, H.D.
Project 3117	Nutrition And Physiology Of The Horse	Ullrey, D.E.
Project 3118	Comparative Nutrition And Physiology Of Wild Animals	Ullrey, D.E.
Project 3170	Performance Of Simmental Cattle Under Northern Michigan Conditions	Ritchie, H.D.
Project 3190	Forage And Grain Utilization By Cattle In The Upper Peninsula	Bucholtz, H.F.
Project 3217	The Fate And Biological Effects Of Xenobiotics In Farm Animal Species	Bursian, S.
Project 3258	An Eggshell Quality Management System	Balander, R.
Project 6833	P-cresol Production In The Intestinal Tract Of The Pig	Yokoyama, M.
Project 6836	Mastitis—Metritis—Agalactia (MMA) In Swine	Miller, E.R.
Project 6837	Development Of A Model: Examine Role Of Progesterone On Initiation Of Estrous Cycles In Cattle	Ireland, J.
Project 6839	Effects Of Caloric Deficit And Body Condition On Insulin And Progesterone In Heifers	Fogwell, R.L.
Project 6840	Embryo Separation Procedures For Production Of Normal Offspring	Dukelow, W.R.
Project 6841	Electronic Monitors For Detection Of Health In Stressed Cattle	Rust, S.
Project 6845	Characterization Of Shifts In Cecal Bacterial Fermentation Induced By Growth Promoting Antibiotics	Yokoyama, M.
Project 6846	Preliminary Study On The Regulation Of Feed Intake By Insulin In Cerebrospinal Fluid	Emery, R.
Project 7522	Photoperiod-Induced Changes In Neurotransmitters And Hormones In Cattle	Tucker, H.A.
Project 8033	Role Of Androgens Of Gene Transcription In Skeletal Muscle Of Pigs	Bergen, W.
Project 8046	Photoperiodic Regulation Of Hypothalamic And Pituitary Cells	Tucker, H.

Biochemistry

Project 1167	Development Of A Computerized Fluorimeter And Its Application To Chemical And Biochemical Problems	Holland, J.F.
Project 1212	Structure-Activity Relationships Of The Freeze-Inhibitor Polysaccharides Of Winter Rye & Barley	Kindel, P.K.
Project 1215	The Role Of Carnitine Acyltransferases In The Regulation Of Cellular Metabolism	Bieber, L.L.
Project 1218	Comparative Enzymological Basis Of Animal Muscle Diseases	Suelter, C.H.
Project 1219	Plant Biochemistry And Plant Growth Regulators	Tolbert, N.E.
Project 1220	Glycosaminoglycan Metabolism	Anderson, R.L.
Project 1223	The Interrelationships Between Dietary Zinc Status And Immune Function	Fraker, P.J.
Project 1290*	Cellular Photosynthetic Processes And The Regulation Of Photosynthesis	Tolbert, N.E.
Project 1452	Development Of Quantitative Vapor Phase Methodology For Steroids	Watson, J.T.
Project 1457	Pig Hepatocyte Preparation Procedure: Hormones And Diet On Binding Phosphofructokinase To Membranes	Deal, W.C.
Project 1503	Metabolism Of Starch Synthesis	Preiss, J.
Project 3164	Fundamental Research And Training In Biochemistry	Sweeley, C.
Project 3215	Biochemical Mechanisms Of Toxicity	Aust, S.D.
Project 6844	Interference In The Development Of Protective Immunity By Malnutrition	Fraker, P.J.
Project 8025	Structure-Activity Relationships Of The Freeze-Inhibitor Polysaccharides Of Winter Rye And Barley	Kindel, P.K.
Project 8032	Alteration Of Immune Development By Gestational Zinc Deprivation	Fraker, P.J.
Project 8038	Lectin Receptors And Cytoskeletal Proteins In Soybean Cells	Wang, John L.
Project 8039	Glycerol Production By Plants	Byerrum, R.U.

Botany & Plant Pathology

Project 417	Investigations On Heritable Resistance To Several Diseases Of Grains	Hart, L.P.
Project 919	Interactions Of Viruses And Cells	Murakishi, H.H.
Project 922	Physiology Of Disease Development And Disease Resistance In Plants	Scheffer, R.P.
Project 953	Effect Of Energy Stress In Soil On The Ecology Of Root-Infecting Fungi	Lockwood, J.L.
Project 962	Tree Fruit Disease Control By Chemicals And Other Means	Klos, E.J.
Project 1040	Turfgrass Pathology	Vargas, J.M., Jr.
Project 1111	Diseases Of Vegetable And Mint Crops And Their Control	Lacy, M.L.
Project 1125*	Virus And Virus-Like Diseases Of Woody, Deciduous Fruit Crops	Ramsdell, D.C.
Project 1133	Bean Disease Investigations	Saettler, A.W.
Project 1176	Development Of Disease Resistant Trees Through Selection And Breeding	Hart, J.H.

Botany & Plant Pathology
(continued)

Project 1206*	Biological Control Of Soil-Borne Plant Pathogens In Integrated Crop Management Systems	Lockwood, J.L.
Project 1255*	Detection, Survival, Infection And Control Of Phytobacterial Pathogens On Seeds And Plant Parts	Fulbright, D.
Project 1259*	Occurrence Of Mycotoxins In Feeds And Foods And Their Effects On Animal And Human Health	Hart, L.P.
Project 1408*	Biological Improvement Of Chestnut (Castanea Sp.)	Fulbright, D.W.
Project 1410	Physiology Of Resistance And Induced Resistance To Disease In Potato	Hammerschmidt, R.
Project 1422	Diseases Of Field Crops—Biology And Control	Hart, L.P.
Project 1491	Genetics, Taxonomy And Biology Of Fungal Pathogens Of Economic Crops: Cytospora Canker	Adams, G.
Project 1496	Development Of Gene Transfer Systems For Fast-Growing Soybean Root Nodule Bacteria	Nadler, K.
Project 1499	Mycorrhizal Root Colonization In Relation To Photosynthate, Water And Nutrient Utilization	Safir, G.R.
Project 1513	Hybrid Variegation In Phaseolus Vulgaris	Sears, B.B.
Project 3071	Investigation On Diseases Of Wheat	Fulbright, D.W.
Project 3123	Etiology, Epidemiology And Control Of Fungal Diseases Of Small Fruit Crop Diseases	Ramsdell, D.C.
Project 3183	Diseases Of Tree Fruit Crops And Their Control	Jones, A.L.
Project 3247	The Breeding And Selection Of New Grape Cultivars For Michigan	Good, N.
Project 3275	Stress Factors Contributing To The Asparagus Decline Syndrome And Replant Problem	Stephens, C.
Project 7503	An Integrated Approach To Blueberry Shoestring Virus Disease Control	Ramsdell, D.C.
Project 7521	Asparagus Decline Syndrome And Replant Problem In Michigan	Stephens, C.
Project 7532	An Integrated Approach To The Control Of Blueberry Virus Diseases	Ramsdell, D.C.
Project 8017	Genetic Resistance To Virus Disease In Somatic Cells Of Food Crop Plant Species	Murakishi, H.R.
Project 8021	Regulation And Localization Of Induced Resistance To Cucumis	Hammerschmidt, R.
Project 8028	Hypovirulence: A Mechanism To Regulate Endothia Parasitica In Forest Ecosystem	Fulbright, D.
Project 8040	Regulation Of Fatty Acid Synthesis Proteins In Soybean	Ohlrogge, J.B.

Chemistry

Project 8005	Separation And Stabilization In Chloroplast Photosystem II	Babcock, G.

Chemical Engineering

Project 9501	Gas Phase HF Saccharification Of Lignocellulosic Materials	Hawley, M.

Crop & Soil Sciences

Project 22	Physical Stress On Crops—Its Detection, Evaluation And Correction	Erickson, A.E.
Project 77	Soil Problems Encountered In Growing Plants In Greenhouses	Warncke, D.D.
Project 115	Corn Breeding, Improvement And Genetics	Rossman, E.C.
Project 268	Organic Soil Investigations	Warncke, D.D.
Project 274	Soil Management Investigations For Sod Production And Turf	Rieke, P.E.
Project 319	Classification, Genesis And Evaluation Of Michigan Soils	Mokma, D.L.
Project 427	Micronutrient Status Of Michigan Soils	Knezek, B.D.
Project 459	Fly Ash Amendments On Sand Soils	Erickson, A.E.
Project 569	Breeding Small Grain Varieties For Michigan	Everson, E.H.
Project 733	Physiology, Establishment, Management, And Nutritional Value Of Forages	Tesar, M.B.
Project 739	Cultural And Management Factors Affecting Potato Quality	Chase, R.W.
Project 908	Fundamental Factors In Cultural And Chemical Weed Control, Weed Competition, And Weed Life Cycles	Renner, K.A.
Project 960	Weed Control—A Component Of Pest Management And Field Crop Production Systems As Related To Chemical And Cultural Practices	Kells, J.J.
Project 1013	Development Of Improved Bean Varieties In Several Classes To Serve Growers And Industry Of Michigan	Adams, M.W.
Project 1063*	Nutrient Management In Conservation Tillage To Improve Productivity And Environmental Quality	Ellis, B.G.
Project 1098*	Relating Soil Wetness To Selected Soil And Landscape Features And To Land Use Decisions	Mokma, D.L.
Project 1103	Adsorption, Transformation And Release Of Inorganic Nutrients By Soils	Ellis, B.G.
Project 1124	Efficient Use Of Plant Nutrients	Vitosh, M.L.
Project 1144*	Dynamics Of Forage Production And Utilization By Beef Cattle	Tesar, M.B.
Project 1170	Sugarbeet Storage	Theurer, J.C.
Project 1192*	Integrating Crop Culture, Chemicals, And Life Cycles To Control Persistent Weeds	Kells, J.J.
Project 1210	Identification Of Soil Environments Which Stress Plant Root Systems	Smucker, A.J.M.
Project 1354	Maximization Of Economic Yields By Improving Dry Edible Bean And Sugarbeet Production Systems	Smucker, A.J.M.
Project 1420	Fate Of Natural And Synthetic Organic Chemicals In Soils And Waters	Boyd, S.A.
Project 1458*	Gains, Losses And Management Of Soil Nitrogen	Tiedje, J.M.
Project 1462*	Soil Productivity And Erosion	Mokma, D.
Project 1470	Physiology And Metabolism Of Plant Growth Regulators And Agricultural Chemicals In Turf	Branham, B.E.
Project 1471*	Chemistry And Bioavailability Of Waste Constituents In Soils	Jacobs, L.W.
Project 1492	Modeling Crop Responses And Environmental Factors Related To Shortages And Excesses Of Water	Ritchie, J.
Project 1497	Environmental And Geotypic Control Of Assimilate Allocation In Crops	Smucker, A.
Project 3062	Turfgrass Breeding	Payne, K.T.
Project 3065	The Physiology And Biochemistry Of Herbicide Action, Selectivity And Degradation	Penner, D.P.
Project 3084	Ecology And Metabolism Of Pesticides By Soil Microorganisms	Tiedje, J.M.
Project 3096	Clay Mineral Investigations	Mortland, M.M.

Crop & Soil Sciences *(continued)*

Project 3122	Development And Correlation Of Soil Test Procedures With Crop Yields And Plant Nutrient Contents	Warncke, D.D.
Project 3128	Systems Of Cropping	Christenson, D.R.
Project 3181	Appraising The Resource Value Of Waste Materials To Develop Greater Utilization On Agricultural Soils	Jacobs, L.W.
Project 3253	Computer Simulation Of Soil Water Infiltration Into Michigan Soils	Kunze, R.J.
Project 3260	Crop Management Studies In Northern Michigan	Leep, R.H.
Project 3262	Soybean Variety Testing	Isleib, T.G.
Project 3265	Breeding Soybean Cultivars For Michigan	Isleib, T.G.
Project 3282	Enhancing Profitability And Sustainability Of Crop Production Systems For Michigan Farmers	Hesterman, O.
Project 7524	Improved Production And Utilization Technology For Michigan Potatoes	Chase, R.
Project 8014	The Pathway Of Microbial Denitrification	Tiedje, J.M.
Project 8031	The Control Of Symbiotic N_2 Fixation By Carbon-Phosphorus Interactions	Paul, E.A.
Project 8044	Virulence Genes Of Agrobacterium Tumefaciens	Thomashow, M.

Entomology

Project 78	Insect Vectors Of Crop Plant Diseases: Identification, Characterization And Mechanism Of Transmission	Whalon, M.E.
Project 193	Fruit Tree Insects	Howitt, A.J.
Project 401	Agriculture And Crop Pollination	Hoopingarner, R.A.
Project 446	Nematode Population Management In Michigan Crop Production	Bird, G.W.
Project 1067*	Weather And Climate Research For Agricultural Decision Making In The North Central Region	Gage, S.
Project 1108	Integrated Control Of Tree Fruit Pests	Whalon, M.E.
Project 1187	Biological Control Of Selected Insect Pests In Michigan	Stehr, F.W.
Project 1190	Biological And Environmental Monitoring For Pest Management Systems	Gage, S.H.
Project 1194	Management Of Field And Forage Crop Insects In Michigan	Ruppel, R.F.
Project 1213	Management Of Forest Defoliating Insects And Related Secondary Insects	Simmons, G.A.
Project 1294*	Black Fly Damage Thresholds, Biology And Control	Merritt, R.W.
Project 1296	Dynamic Damage Assessment To Crops From Insect Defoliation	Gage, S.H.
Project 1306*	Integrated Management Of Plant Parasitic Nematodes	Bird, G.W.
Project 1322	Biology And Management Of Insect Pests Of Vegetable Crops	Grafius, E.J.
Project 1331*	Reduction Of Corn Losses Caused By Nematodes In The North Central Region	Bird, G.W.
Project 1353	Michigan Pesticide Impact Assessment Program	Bird, G.
Project 1435	Factors Determining Host Finding, Acceptance, And Suitability For Insect Behaviors	Miller, J.R.
Project 1460*	Incidence, Biology, And Management Of The Pine Wilt Complex	Bird, G.W.
Project 1482	Biotic And Abiotic Stress Interactions Between Insects And Their Host Plants	Gage, S.

Entomology
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Project 1488*	The Gypsy Moth And Its Natural Enemies: Behavior And Population Determinants	Simmons, G.A.
Project 1489*	Impact Of Integrated Crop Management Practices On European Corn Borer And Related Stalk Boring Insects	Ruppel, R.F.
Project 3016	Population Dynamics And Management Of Cereal Leaf Beetle In Michigan	Gage, S.H.
Project 3114	Management Of Man Biting Insect Problems In Michigan	Newson, H.D.
Project 3269	Using Behavior To Improve Pesticide Efficiency And Reduce Nontarget Impact	Ayers, G.
Project 7527	Management of Insecticide Resistance In The Colorado Potato Beetle	Grafius, E.J.
Project 7528	Three Models For Predicting Potato Plant Growth And Tuber Yield In North-Central Potato Systems	Bird, G.
Project 8035	Cull Onions As Trap Crop For Onion Maggot	Miller, J.

Family & Child Ecology

Project 1394*	A Study Of Beliefs About Parenting In Rural And Urban Populations	Boger, R.P.
Project 1424*	Stress, Coping, And Adaptation In The Middle Years Of The Family Life Cycle	Bubolz, M.
Project 1439*	Dynamics Of Life Plans And Attainment Of Low-Income Youth: A Longitudinal Analysis	Schiamberg, L.
Project 1500	Assessing The Physical And Emotional Consequences Of Financial Distress In Michigan Farm Families	Soderman, A.
Project 1507*	Family Resource Utilization As A Factor In Determining Economic Well-Being Of Rural Families	Keefe, D.
Project 3251	Profile Of Michigan Youth: 10-14 Years Of Age—1983, 1987	Keith, J.G.

Fisheries & Wildlife

Project 940	Ecological Relationships Of Pesticides, Radionuclides, And Nutrients With Organisms In Aquatic Community	Kevern, N.P.
Project 1312	Environmental Impacts On Fish Ecology In Nearshore And Connecting Waters Of Upper Great Lakes	Liston, C.R.
Project 1385	Wildlife Responses To Forest Management In Michigan	Haufler, J.B.
Project 1387	Mechanistic Factors Determining Aquatic Fertility	King, D.L.
Project 1409	Ecology, Population, Dynamics And Management Of Michigan Fishes And Their Food Organisms	Taylor, W.W.
Project 3077	Environmental And Genetic Components Of Reproduction In Bird Populations	Prince, H.H.
Project 3248	Improving Productive Public Involvement In Agriculture And Natural Resource Problem Solving	Peyton, R.B.
Project 3254	Nutritional Requirements For Fishes Cultured In Michigan	Garling, D.
Project 3264	Aquatic Productivity, Light In Lakes And Ponds	McNabb, C.D.

Food Science & Human Nutrition

Project 457	Effects Of Composition Upon Meat Quality	Pearson, A.M.
Project 603	Physical And Chemical Factors Related To Stability Of Processed Foods	Stine, C.M.
Project 679	Effect Of Processing On Food Composition And Quality	Markakis, P.
Project 1150	Comparative Aspects Of Nutrition And Lipid Metabolism	Romsos, D.R.
Project 1165*	Quality And Nutritive Value Of Processed Potatoes	Cash, J.N.
Project 1174*	Food Quality And Energy Usage In Foodservice Systems: Microwave And Convective Thermal Processing	Zabik, M.E.
Project 1193	Dietary And Physiological Factors Affecting Bioavailability And Utilization Of Nutrients	Chenoweth, W.C.
Project 1209	Quality Of Fresh And Processed Meat Products	Price, J.F.
Project 1211	Dietary Fat/Carbohydrate Relationships To Selected Health Parameters	Schemmel, R.A.
Project 1233	Functional Properties And Utilization Of New Or Improved Fish Products	Smith, D.
Project 1242	Nutritional Factors Pre- And Postnatally Influencing Organ Development And Function	Bond, J.T.
Project 1323	Process Efficiency, Quality, And Nutrient Composition Of Fruit And Vegetable Products	Uebersax, M.A.
Project 1344	The Effects Of Processing Cooking And Storage On The Acceptability And Safety Of Food Products	Gray, J.I.
Project 1395	Function Of Enzymes In Cheeses And Fermented Dairy Products	Partridge, J.A.
Project 1396	Foodservice Systems Information, Equipment And Personnel	Sawyer, C.A.
Project 1413	Metabolism And Function Of Vitamin A	Zile, M.H.
Project 1416*	U.S. Food Demand And Consumption Behavior	Zabik, M.E.
Project 1419	Processing Treatments Influencing Functional Properties And Utilization Of Muscle Foods	Booren, A.M.
Project 1444*	Modification Of Human Diets Designed To Affect Lipid Metabolism	Romsos, D.
Project 1448	Microbial Food-Borne Diseases	Pestka, J.
Project 1477	Vitamin Stability In Food Processing And Storage	Ott, D.B.
Project 1478	Genetic Improvement Of Beans (Phaseolus Vulgaris L.) For Yield, Pest Resistance And Food Value	Uebersax, M.
Project 1480	Pantothenic Acid Nutriture: Requirement, Absorption And Metabolism	Song, W.O.
Project 1483	Effects Of Changes On Engineering Properties Of Biological Materials During Processing And Storage	Steffe, J.
Project 1504	Evaluation Of Nutritional Status And Food Behavior	Hoerr, S.
Project 1506*	Development Of New Processes And Technologies For The Processing Of Poultry Products	Smith, D.M.
Project 1510	Mechanism Of Establishment Of Bifidobacterium Bifidium Var. Pennsylvanicus In The Human Gut	Brunner, J.R
Project 1511	Development Of Technology For The Genetic Engineering Of The Filamentous Fungi: *Mucor* And *Rhizopus*	Linz, J.E.
Project 1512	Mass Transfer And Separations In Bioprocesses	Grulke, E.
Project 3092	Effect Of Raw Material, Processing And Storage Factors On Food Cost And Quality	Wishnetsky, T.
Project 3202	Relationship Of Diet And Cancer	Bennink, M.R.
Project 3221	Processing And Quality Evaluation Of Fruits And Vegetables	Cash, J.N.
Project 3276	Food Industry Institute	Dutson, T.

Food Science & Human Nutrition (continued)

Project 3278	Storage And Shelf-Life Stability Of Processed Fruits And Vegetable Products	Filadelfi, M.A.
Project 6838	Animal Mycotoxicoses: Prevention And Therapy	Pestka, I.J.
Project 8006	Metabolism And Function Of Retinoic Acid In The Small Intestine	Zile, M.H.
Project 8034	Indices For Assessment Of Pantothenic Acid Status	Song, W.O.
Project 8049	Metabolism And Function Of Retinoic Acid In The Small Intestine	Zile, M.

Forestry

Project 936	Physiological Genetic Studies Of Forest Trees	Hanover, J.W.
Project 978	Financial Evaluation Of Forest Management Opportunities	Potter, K.
Project 1048	Fiberbonding In Fiberboard Manufacture	Suchsland, O.M.
Project 1100*	Strategies And Procedures For Advanced Generation Breeding Of N.C. Forest Species	Hanover, J.W.
Project 1148	Development Of Techniques In Forest Biometry	Ramm, C.W.
Project 1149	Timber Market Dynamics	Manthy, R.S.
Project 1180	Ecological Factors Affecting Tree Productivity	Pregitzer, K.S.
Project 1198	Biology Of Terpenes In Woody Plants	Hanover, J.W.
Project 1207	Growth, Yield, And Physiology Of Intensively Grown Tree Species In Michigan	Dickmann, D.I.
Project 1438	Enhancing Amenity Values Of Urban And Rural Trees	Kielbaso, J.J.
Project 1447*	Chemistry Of Atmospheric Deposition—Effects On Agriculture, Forestry, Surface Waters, And Materials	Hart, J.B.
Project 1469	Forest Soil Evaluation And Management Using Agro-Chemicals, Soil Amendments And Cultural Practices	Hart, J.B.
Project 1485	Stress And Strain Measurements In Wood And Wood Products	Sliker, A.
Project 1486	Screening, Genetic Enhancement, And Production Of High Value Chemicals From Woody Plants	Hanover, J.W.
Project 1487	Development Of Tissue Culture Systems For Genetic Improvement Of Woody Plants	Keathley, D.E.
Project 1494	Intensive Management For The Regeneration Of Conifers In Michigan	Lantage, D.
Project 1509	Environmental And Genetic Control Of Carbon Allocation And Chemical Defense In Trees	Pregitzer, K.
Project 1516	Forest Resources Planning	Leefers, L.
Project 3157	Accelerating Tree Growth Through Breeding And Intensive Culture	Hanover, J.W.
Project 3162	Production Efficiency In The Industrial Use Of Wood	Huber, H.A.
Project 3273	Michigan Woodlands Management	Marty, R.
Project 7525	Chemistry And Preservation Potential Of Secondary Metabolites From Black Locust (Robinia Pseudoacacia)	Hanover, J.W.
Project 7536	Advanced Technology Application To Eastern Hardwoods	Huber, H.
Project 8029	Genetic Structure And Adaptation Of Natural Populations Of Spruce	Hanover, J.W.
Project 8043	Resin Distribution And Horizontal Density Effects On Wood Composite Durability	Suchsland, O.

Geography

Project 3279	Protective Zoning Methods For Michigan's Coastal Sand Dunes	Chubb, M.

Horticulture

Project 650	Modification Of Tree Fruits To Facilitate Mechanization Of Cultural Practices	Hull, J., Jr.
Project 792	Cultural Practices For Vegetables To Facilitate Mechanized Production And Harvest Procedures	Price, H.C.
Project 909	Biology, Ecology, And Management Of Weed Pests In Horticultural Cropping Systems	Putnam, A.R.
Project 935	Effects Of Biologically Active Chemicals On Plant Growth And Development	Bukovac, M.J.
Project 1045	Controlling Yield And Quality Of Deciduous Tree Fruits	Dennis, F.G., Jr.
Project 1153*	Quality Maintenance And Control In The Marketing And Storage Of Vegetables	Herner, R.C.
Project 1155*	Postharvest Physiology Of Fruits	Dilley, D.R.
Project 1222*	Introduction, Maintenance, Evaluation And Utilization Of Plant Germplasm	Iezzoni, A.
Project 1272	Physiology Of Carbon Balance In Deciduous Fruit Trees	Flore, J.A.
Project 1305*	Rootstock And Interstem Effects On Pome And Stone Fruit Trees	Perry, R.
Project 1325	Cole Crop Production And Culture	Zandstra, H.H.
Project 1380	Strawberry, Blueberry And Bramble Improvement	Hancock, J.F.
Project 1386	Breeding And Genetics Of Floriculture Plants	Ewart, L.C.
Project 1428	Stone Fruit Breeding	Iezzoni, A.F.
Project 1461*	Freeze Damage And Protection Of Fruit And Nut Crops	Howell, G.S.
Project 1468	Mineral Nutrition Of Vegetable Crops	Widders, I.E.
Project 1517	Optimization Of The Root Zone Environment In Greenhouse Crop Production	Biernbaum, J.
Project 3012	Chemical Regulation Of Growth And Nitrogen Metabolism In Plants	Ries, S.K.
Project 3031	Environmental And Physiological Variables Effect On Growth, Quality And Marketability Of Garden Crops	Carlson, W.H.
Project 3218	Manipulation Of Viticulture To Achieve Maximum Quality, Yield, And Resistance To Freeze Damage	Howell, G.S.
Project 3227	Adaption Of Fruit Cultivar And Cultural Practices To Michigan	Kesner, C.D.
Project 3231	Gene Manipulation In Crop Plants Using Cell Fusion	Sink, K.C.
Project 3247	The Breeding And Selection Of New Grape Cultivars For Michigan	Hancock, J.F.
Project 3266	Breeding And Genetics Of Onions	Ewart, L.C.
Project 3270	Postharvest Storage Of Field Grown Hardy Herbaceous Perennials And Woody Ornamentals	Cameron, A.C.
Project 3272	Physiological And Environmental Factors Influencing Growth And Development Of Flower Crops	Heins, R.D.
Project 3281	Mineral Nutrition Of Michigan Fruit Crops	Hanson, E.
Project 7523	Factors Causing Tree Decline And Reduced Production Of Cherry, Peach And Plum Trees Under Michigan Climatic Conditions	Flore, J.A.
Project 7530	Apple Quality Improvement Through Production, Storage And Distribution Technology	Kelly, J.
Project 8045	T-DNA: A Novel Marker System For Asymmetric Gene Transfer By Cell Fusion	Sink, K.

Human Ecology

Project 3152	Function Of The Family Ecosystem In A World Of Changing Energy Availability	Gladhart, P.M.

Human Environment & Design

Project 1442*	Limiting Pesticide Exposure Through Textile Cleaning Procedures And Selection Of Clothing	Slocum, A.
Project 3256	Toward Achieving Michigan's Rural Employment Potential: The Role Of Resort Area Retailing	Sternquist, B.
Project 3261	Family Adaptation To Changing Resources And Environments: Improving Quality Of Life In Rural Areas	Sontag, M.S.

International Agriculture

Project 7534	Development Of A Barley Yield Simulation Model	Ritchie, J.T.

Large Animal Clinical Sciences

Project 1316	Trace Element Interactions And The Relative Influence Of Cupric And Sulfate Ions On Selenium Metabolism	Stowe, H.D.
Project 1415*	Infectious Agents Affecting Reproduction In Cattle	Gibson, C.D.
Project 1417*	Bovine Respiratory Diseases: Risk Factors, Pathogens, Diagnosis And Management	Baker, J.
Project 1434	Bovine Hepatic Lipidosis Studies	Herdt, T.H.
Project 6805	Bovine Leukemia Virus Infection In Calves	Kaneene, J.B.
Project 6808	Prevalence And Economic Importance Of Fascioloides Infection In Michigan Livestock	Schillhorn Van Veen, T.
Project 6832	Significance Of The Genetic Predisposition Of Pigs To Hypo- And Hyperselenemia	Stowe, H.
Project 6847	Hepatic Phospholipid Synthesis In Ruminants With Fatty Liver	Herdt, T.
Project 7518	Economic Impact And Cost Benefit Analysis Of Bovine Mastitis	Bartlett, P.C.
Project 7520	Role Of Endotoxin And Neutrophilis In Bovine Pneumonic Pasteurellosis	Robinson, N.
Project 7526	Immunology And Pathogenesis Of *Hemophilus Pleuropneumoniae* Infection In Swine	Thacker, B.

Mechanical Engineering

Project 8041	Experimental And Theoretical Studies Of Wind-Aided Flame Spread On Wood	Wichman, I.

Microbiology & Public Health

Project 1136	Herpesvirus Disease: Antigens In Cells Infected With Marek's Disease Herpesvirus	Velicer, L.F.
Project 1177	Biochemical Symbiosis Between Termites And Their Intestinal Microbes	Breznak, J.A.
Project 1300	Studies On Microbial Degradation Of Lignin	Reddy, C.A.
Project 1314	Host-Symbiont Recognition In The Nitrogen-Fixing Rhizobium-Clover Symbiosis	Dazzo, F.B.
Project 1371	Evaluation Of An In Vivo Model To Study Latent Infections Caused By Pseudorabies Virus	Maes, R.K.
Project 1453	Structure/Function Relationships In Chicken Globin And Histone Genes	Dodgson, J.
Project 1473*	Gains, Losses And Management Of Soil Nitrogen	Dazzo, F.
Project 1481	Characterization And Inhibition Of Bacterial Urease	Hausinger, R.P.
Project 3116	Bacterial Ecology: Diverse Energy Reactions And Regulation In Bacteria	Uffen, R.L.
Project 3120	Microbial Decomposition Of Organic Matter In Aquatic Systems	Klug, M.J.
Project 3257	Genetic Engineering Of Rhizobium Japonicum, The Soybean Symbiont, For Improved Agronomic Properties	Chelm, B.K.
Project 6827	Experimental Parasitology	Williams, J.F.
Project 6842	Immunobiology Of *Haemophilus Pleuropneumoniae* Infection In Swine	Mulks, M.
Project 7513	Biotechnology And Proteins In Marek's Disease, Immunosuppression And Protection	Velicer, L.
Project 7535	Recombinant DNA Proteins In Marek's Disease: Immunosuppression And Protection	Velicer, L.F.
Project 7537	Antibody Response In The Bovine Lower Respiratory Tract To Inhaled Pasteurella Hemolytica	Walker, R.
Project 8030	Marek's Disease Herpesvirus Molecular Biology: Secretary Glycoprotein Gene Analysis	Velicer, L.F.
Project 9500	Improving The Bean-Rhizobium Symbiosis In Mexico	Dazzo, F.

MSU-DOE Plant Research Lab

Project 1464	Molecular Basis Of Disease Resistance To Powdery Mildew In Barley	Somerville, C.R.
Project 1501	Genetic Manipulation Of Lactic Dehydrogenase Enzymes In Cereals In Subproject Title	Hanson, A.D.
Project 8012	Directed Genetic Modification Of RuBP Carboxylase/Oxygenase	McIntosh, L.
Project 8020	The Significance Of Stress Enhanced Cell Wall Hydro-Syproline Biosynthesis	Lamport, D.
Project 8026	Genetic Control Of Gibberellin In Metabolism In Relation To Development In Tomato	Zeevaart, J.A.
Project 8027	Development And Physiological Gene Regulation In The Rhizobium/Legume Symbiosis	Thomashow, M.
Project 8036	Cell Wall Proteins Of The Cereals	Lamport, D.T.
Project 8037	Genetic Modification Of Photosynthesis And Photorespiration	Somerville, C.
Project 8048	Molecular Basis And Function Of Stress-Induced Betaine Synthesis In Plants	Hanson, A.

Packaging

Project 1493	Consumer Size Modified Atmosphere Packaging Of Fresh Produce	Lee, J.
Project 1520	Diffusion And Sorption Properties Of Plastics As Related To The Quality Of Packaged Products	Giacin, J.
Project 3108	Control Of Damage And Loss In Distribution	Goff, J.W.
Project 7538	Use Of Eastern Hardwoods In Wood Fiber-Plastic Composites	Selke, S.

Park & Recreation Resources

Project 340	Park Facilities	Holecek, D.F.
Project 1378	Recreation Resource Economics: The Relationship Between Agriculture And Tourism In Michigan	Propst, D.B.
Project 1432	Impact Of Forest Management On Recreation And Tourism In Local Economies	McDonough, M.
Project 1436	Psychology Of Recreation And Tourism: The Relationship Between The People And The Resource	Fridgen, J.D.
Project 1514*	Tourism Impacts And Development Alternatives From The Local Rural Government Perspective	Stynes, D.
Project 3280	Travel, Tourism And Recreation Resource Center	Holecek, D.F.

Pathology

Project 1154*	Prevention And Control Of Enteric Diseases Of Swine	Waxler, G.L.
Project 1307	Pathologic Effects Of Chemicals Of Importance To Michigan Agriculture	Sleight, S.D.
Project 1333	Mechanisms Of Pulmonary Damage In Neonatal Calves Exposed To Pasteurella Hemolytica	Slocombe, R.F.
Project 6843	Pathophysiology Of Salmonid Gas Bubble Disease In The Hatchery	Bell, T.G.
Project 7529	Neutrophil-Mediated Mechanisms Of Lung Damage In Bovine Pneumonic Pasteurellosis	Watson, G

Pesticide Research Center

Project 1309	Toxic Effect Of Chlorinated And Pyrethroid Pesticides	Matsumura, F.
Project 1364	North Central Leader Laboratory Program For Minor Use Pesticide Research To Supplement The IR-4 Program	Hollingworth, R.
Project 1412	Processes Affecting Pesticides And Other Organics In Soil And Water Systems	Zabik, M.
Project 1414	Effects Of Toxic Chemicals On Aquatic Systems	Giesy, J.P.
Project 1451	Molecular Aspects Of Aluminum Toxicity In Plant Cells	Haug, A.
Project 7509	North Central Leader Laboratory Program For Minor Use Drug Research To Supplement The IR-4 Program	Hollingworth, R.
Project 7533*	North Central Leader Laboratory Program For Minor Use Drug Research To Supplement The IR-4 Program	Matsumura, F.

Physiology

Project 3097	Mechanisms Of Neuroendocrine And Endocrine Regulation Of Reproduction And Metabolism	Riegle, G.D.

Resource Development

Project 174	Michigan's Water Resources	Humphrys, C.R.
Project 1075	Natural Resources In Economic Development: Spatial Analyses	Chappelle, D.E.
Project 1093	Development Data For Michigan Community Decision Makers	Kimball, W.J.
Project 1102	Government, Science and Resources: Interactions And Conflicts	Bronstein, D.A.
Project 1285	Comprehensive Resources Inventory And Evaluation System (CRIES)	Schultink, G.
Project 1515*	Rural Development Strategies To Mediate Farm Crisis Impacts On Families And Communities	Vlasin, R.
Project 3235	Mineral Lands Development, Energy Requirements And Environmental Impacts	Kakela, P.J.
Project 3267	Sustainable Agriculture: The Role Of Bio-Management In Agricultural Systems	Edens, T.
Project 3268	Impact Of Extension Leadership Program And Factors Associated With Leadership Effectiveness	Thullen, M.
Project 3277	A Critical Review Of Farmland Scarcity In Michigan	Nickel, P.

Sociology

Project 1476*	Socioeconomic Dimensions Of Technological Change, Natural Resource Use, And Agriculture Structure	Schwarzweller, H.K.
Project 3165	Michigan County And Place Characteristics 1930-1980	Harris, C.K.
Project 3222	Changing Structure Of Agriculture	Schwarzweller, H.K.
Project 3234	Aspects Of Small Scale Primary Production In Michigan	Harris, C.K.
Project 3283	Trends And Differentials In Infant Mortality In Michigan By Residence, Race And Sex	Johnson, N.E.

Zoology

Project 8019	The Genetics Of Host Selection In Rhagoletis Fruit Trees	Bush, G.

* = Regional research

List of MAES Contributors

July 1, 1986
to June 30, 1987

Abbott Laboratories
Adkin, Glenn & Marian
Agency for International Development
Agri Sales, Inc.
Agricultural Products Co., Inc.
Agriculture, U.S. Dept. of
Agrimar Corporation
Agro-Chem, Inc.
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Campbell, Louise A.
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Consumers Power Company
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Cooperative Elevator Company
Corn Refiners Association
Cornnuts, Inc.
Corrugated Plastic Tubing Association
CPN Corporation
DCA Food Industry
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Diamond Crystal Salt Company
Dominos Pizza, Inc.

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Dow Chemical Company
Dow Consumers Products, Inc.
Dow Corning Corporation
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Dunkley Company
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Environmental Protection Agency
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Farm Bureau Services
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Fenn Valley Vineyards
Fermenta Plant Protection Company
Fish American Foundation
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Food Machinery & Chemical Corporation
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Gehling, George
Gene Tree, Inc.
General Electric Company
General Foods Corporation
General Mills, Inc.
George F. Ackerman Company
George J. Ball Inc.
Gerber Products Company
Gibbett Hill Foundation
Glei Orchards
Gloeckner, Fred C. Foundation
Great Lakes Fisheries Commission
Great Lakes Frozen Foods, Inc.
Great Lakes Hybrids, Inc.
Greater Detroit Sausage Mfg. Assn.
Griffin Corporation
Griffith Laboratories, Inc.
Grosse Pointe Garden Club
Grower Services Corporation
Growmark, Inc.
Gustafson, Inc.
Harraway, Denys H.
Harris Moran Seed Company
Harvard University
Hastay's Greenhouse
Hathaway, William
Hawaiian Commercial & Sugar Company
Heinz, H.J. Company
Hilton-Davis Chemical Company
HLR Sciences, Inc.
Hoechst-Roussel Pharmaceuticals, Inc.
Hoffman Laroche
Hyeon, Seok
ICI America, Inc.
Illinois Inst. of Technology Res. Inst.
Illinois, University of
Ingersoll-Rand Company
Inst. of International Education
Interior, U.S. Dept. of the
International Dwarf Fruit Tree Assn.
Intl. Service Natl. Agric. Research
Iowa, University of
J & J Bee Service, Inc.
Kalamazoo Valley Plant Growers Coop.
Kalamazoo, County of
Kalo Laboratories, Inc.
Karnemaat, Mr. & Mrs. Al
Kellogg, W. K. Company
Kellogg, W. K. Foundation
Kielbaso, James & Gloria
King Milling Company
Kittel, Ivan
Knappen Milling Company
Krieger, Robert
Kzolowicx, Stanley
Land O'Lakes, Inc.
Lansing Grain Company
Lerew's Farm Market, Inc.
Lesco, Inc.
Library of Congress
Lilly, Eli & Company
Lilly Research Laboratories

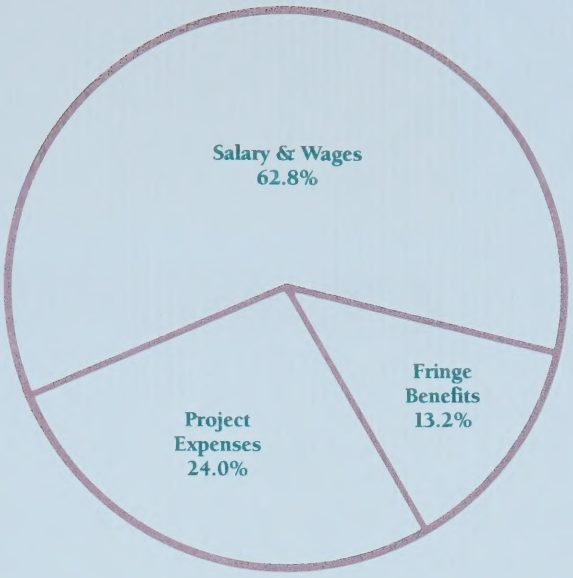
Mallinckrodt Chemical Works
Man. Res. & Scholarship Fund
Marcotte, Oliver
Marietta Chemicals, Martin
Marvaso's Greenhouses
Mast, Henry Greenhouses
Mast. Neal & Sons Greenhouses
McKnight Foundation
McLeod, Richard S.
Mead Corporation Foundation
Mead Paper Company
Meat Processing Research Corp., Inc.
Mennel Milling Company
Merck & Company, Inc.
Michigan Land Improv. Contractor Assn.
Michigan Agricultural Commodities, Inc.
Michigan Apple Research Committee
Michigan Asparagus Research Committee
Michigan Assn. of Nurserymen
Michigan Bean Commission
Michigan Beef Industry Commission
Michigan Beekeeper's Assn.
Michigan Biotechnology Institute
Michigan Blueberry Growers Assn.
Michigan Carrot Committee
Michigan Cattlemen's Assn.
Michigan Cherry Committee
Michigan Crop Improvement Assn.
Michigan Dept. of Agriculture
Michigan Dept. of Commerce
Michigan Dept. of Education
Michigan Dept. of Natural Resources
Michigan Dept. of Public Health
Michigan Electric Cooperative Assn.
Michigan Energy & Resource Research Assn.
Michigan Foundation Seed Assn.
Michigan Onion Committee
Michigan Package Carrot Council
Michigan Peach Sponsors
Michigan Pear Research Assn.
Michigan Pesticide Assn.
Michigan Plant Growers Co-op., Inc.
Michigan Potato Industry Commission
Michigan State Florists Assn.
Michigan State Millers Assn.
Michigan, State of
Michigan Sugar Company
Michigan Turfgrass Foundation
Michigan, University of
Michigan Vegetable Council, Inc.
Michigan, American Heart Assn. of
Michelin America Reg. Dev. Corporation
Miles Laboratories
Miller Johnson Snell Cummiskey
Mink Farmers Research Foundation
Minnesota Golf Course Superintendents Assn.
Mint Industry Research Council
Mitsuwa Nursery, Inc.
Mobay Chemical Corporation
Monitor Sugar Company
Monsanto Company
Moorman Manufacturing Company
MSU Foundation
Muskegon County
Nabisco, Inc.
National Aeronautics and Space Adm.
National Assn. of Animal Breeders
National Grape Cooperative Assn.
National Institute of Health
National Livestock & Meat Board
National Particleboard Assn.
National Pork Producers Council
National Science Foundation
Neogen Corporation
North American Agricultural Products, Inc.
Northrup King & Company
Noyes, Jessie Smith Foundation, Inc.
Oakland County Extension Service
Ohio Floriculture Foundation
Ohio State University
Olds, L.L. Seed Company
Ore-Ida Foods, Inc.
Oregon, University of
Parker, Jean
Parrish & Heimbecker
PCS Sales
Pennwalt Chemical Corporation

Petoseed Company, Inc.
Pfizer, Inc.
Pickle Packers International
Pillsbury Company
Pioneer Hi-Bred International, Inc.
Plant Genetics, Inc.
Plastics Recycling Foundation
Potato Chip/Snack Food Assn.
PPG Industries, Inc.
Pratt & Whitney Aircraft
Professional Grounds Management Society
Public Communication Assn.
Quaker Oats Company
Read, D. G.
Resources for the Future, Inc.
Reuter-Stokes, Inc.
Rheometrics, Inc.
Rhone-Poulenc, Inc.
Ringer Corporation
Rohm & Haas Company
Rose, Richard C.
Ruffed Grouse Society
Rutgers University
Sandia National Laboratories
Sandoz, Inc.
Schering Corporation
Schuehrer, David L.
Scott, O.M. & Sons Company
SDS Biotech Corporation
Select Sires, Inc.
Shell Chemical Corporation
Shivvers Enterprises, Inc.
Sierra Chemical Company
Sigma One Corporation
Smith Kline Corporation
Smithsonian Institution
Soule, R.P. Jr.
Soybean Promotion Committee of Mich.
Sport Fishery Research Foundation
Staley Manufacturing Company
Stanek and Sons
Star of the West Milling Company
Statens Husdyrbrugsforog
Stauffer Chemical Company
Stewart, Kerr & Dorothy
Sun Refining & Marketing Company
Sun Seeds
Terra International, Inc.
Textron, Inc.
Toro Company
Toyosha Company, Ltd.
Twin Lakes Nursery, Inc.
U.S. Forest Service
U.S. Geological Survey
U.S. Golf Assn.
Union Carbide Corporation
Uniroyal, Inc.
United Gamefowl Breeders
Upjohn Company, The
Van Den Brink, Ceel & Ruth
Varner, Gregory V.
Vaughan's Seed Company
Village Edge Farms
Viskase Corporation
Vlasic Foods, Inc.
VS Crop Protection Corporation
Weber, Timothy M.
Wells, Arthur L.
Winrock International
Wright, Dan R.
Wyeth Laboratories
Zeerip, Mr. and Mrs. David E.
Zoecon Corporation
Zoological Society of San Diego
Zymetech Limited

Financial Report

July 1, 1986
to June 30, 1987

Distribution Of Appropriated Funds



INCOME:			**$35,088,655**
Federal Appropriations:		$4,212,283	
Hatch	$3,265,909		
McIntire Stennis	117,385		
Hatch RRF	732,968		
Hatch Animal Disease Research	96,021		
State Appropriations:		18,306,824	
TOTAL APPROPRIATIONS:		22,519,107	
Grants—Federal, State & Private		12,569,548	

EXPENSES:		**$35,088,655**
Salaries	$14,159,702	
Fringe Benefits	2,962,439	
Project Expenses	5,396,966	
Grants—Federal, State & Private	12,569,548	

Personnel

(Full-Time Equivalents)

Research Staff	160
Professors	76
Associate Professors	32
Assistant Professors	24
Research Associates and Specialists	28
Support Staff	152
Administrative Professionals	58
Supervisors	3
Clerical	53
Technicians	38

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AGRICULTURAL EXPERIMENT STATION
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Michigan Agricultural Experiment Station
Robert G. Gast, Director
Michigan State University
East Lansing, Michigan 48824-1039

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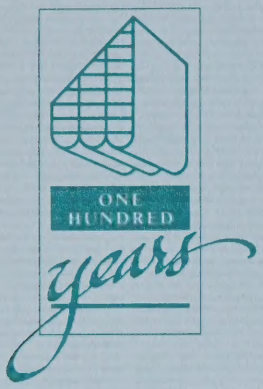

SR-19, January 1988

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